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An Epic *of* Brittany

Brigadier General R. W. Grow, *United States Army*

IN the bright early morning sunshine of 8 August 1944, a quarter ton draped with a white sheet and flying a white flag sped south through the village of Gouesnou to the high ground overlooking the blue estuary and the city of Brest. The German outpost stopped the truck, blindfolded the occupants and drove it to German headquarters in the city. Here Lieutenant Colonel Ernest Mitchell, Division G-2, with his interpreter presented the demand for the surrender of Brest:

HEADQUARTERS 6TH ARMORED DIVISION
Office of the Commanding General

APO 256, U S Army
8 August 1944

MEMORANDUM:

TO : Officer Commanding German Forces in Brest

1. The United States Army, Naval and Air Force troops are in position to destroy the garrison of Brest.

2. This memorandum constitutes an opportunity for you to surrender in the face of these overwhelming forces to representatives of the United States Government and avoid the unnecessary sacrifice of lives.

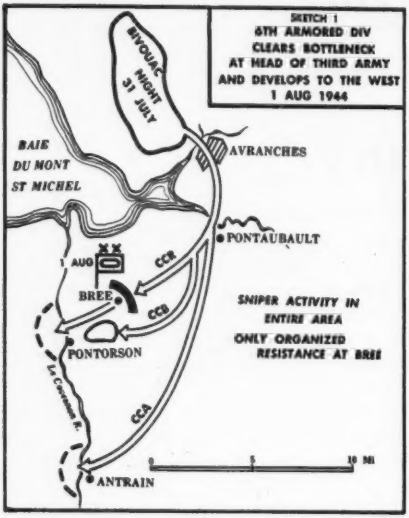
3. I shall be very glad to receive your formal surrender and make the detailed arrangements any time prior to 1500 this date. The officer who brings this memorandum will be glad to guide you and necessary members of your staff, not exceeding six to my headquarters.

R. W. GROW
Major General, USA
Commanding

Unfortunately for us the command of Brest had passed on the previous day to General Ramcke of the German 2d Paratroop Division who had slipped in from the south while we approached from the north. He politely but firmly refused, and Colonel Mitchell was escorted to the outpost and released. The tired troops prepared to attack.

Just a week before, Tuesday the first of August, the long thin column had pushed its way through the debris of the Avranches bottleneck and "turned the corner" toward the west. The 4th Armored had captured Avranches, we had taken Granville and the coast line to the south and southeast. The 79th, 83d and other divisions were closing in. All had to form single column from Avranches to Pontaubault. During the evening of 31 July we had sent our reserve through to hold the bridgehead at Pontaubault, relieving part of the 4th Armored. At dark that Monday evening no plan for an advance beyond the bridgehead had reached the division. German air was active but it was the rubble strewn road that slowed the Reserve Combat Command (CCR) not the bombs.

Third Army became operational at mid-



night and by 0400 on 1 August we realized what that meant. Corps orders were simple: Not to stop at the Pontaubault bridgehead, push west up the center line of the peninsula in two or more columns, bypass determined resistance, capture Brest. The Corps Commander's visit to the Division CP during the morning was the last we saw of him until Corps headquarters reached Lesneven, near Brest, eighteen days later. The MP's of the 6th Armored Division took over control of the bottleneck road and every bulldozer we could locate worked on the wreckage while all that day and through the night the steel column pushed on, the trains clearing by daylight. The Reserve Command that was to form a bridgehead at Pontaubault continued in the lead with a new mission of a bridgehead at Pontorson. This command bumped into real trouble at Bree where the well camouflaged enemy let the advance guard through, then opened surprise fire on the leading artillery battery. Three of our SP guns were knocked out by accurate 88-mm fire before the column could deploy. In a three hour battle the strong point was wiped out and a bridgehead secured at Pontorson with a loss to us of seventy casualties while the enemy lost an 88, three batteries of horse-drawn artillery and some ninety prisoners.

In the meantime the cavalry reconnaissance squadron following CCR through Avranches, deployed to both flanks of the main road and paralleled the advance. Combat Command "A" (CCA) next in column, passed through Pontaubault in midafternoon and took the south route, paralleling that of CCR. The hedges were full of snipers who proved more of a nuisance than a menace. Many were killed and some captured but seldom was movement held up. After a week of action, snipers had become an old story, the men made short shrift of them.

Combat Command A made an uncontested crossing of Le Couesnon River south of Pontorson so that by midnight we had two bridgeheads controlling two good routes west.

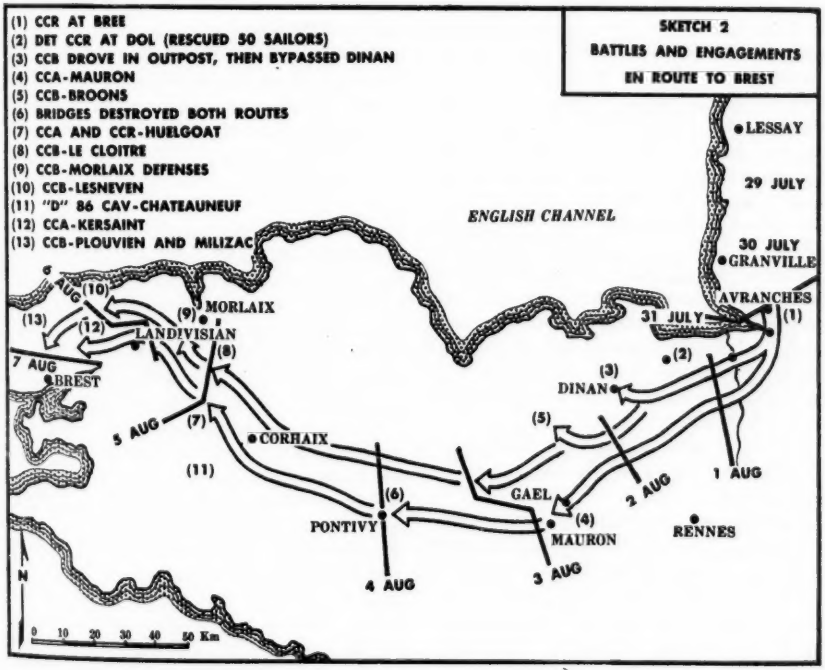
Combat Command B (CCB), next in column, was to be the right column in the advance. Passing through Avranches early in the evening it advanced by a center route with the division artillery and bivouaced shortly after midnight east of Pontorson, prepared to pass through CCR at daylight.

The Division CP set up in wheatfields near Bree where we had a grandstand seat for the great "fireworks" display at Avranches. All night the enemy fighter bombers strafed and bombed the bottleneck. Our divisional antiaircraft artillery accounted for six enemy planes together with other friendly ack-ack rendered the balance ineffective. Our trains suffered no losses other than shattered nerves, and sunrise found the entire division clear and "in the open" with no division boundaries to worry about, no definite enemy information, in fact nothing but a map of Brittany and the knowledge that resistance was where you found it. Here was

as wide open a field for exploitation as was ever presented to one division operating alone,with only one string attached, "capture Brest." We thought the 79th Division would be right behind us, then we heard it was to be the 83d, but finally on 4 August the Army Commander said we would have no supporting troops. Task Force "A," working along the north coast, would get up as soon as possible. (This force actually reached Lesneven 9 August but was prevented by other missions from approaching closer to Brest.) Our left (south) flank would be secured for a portion of the way by the 4th Armored Division, which followed us, as soon as it could come up. However our later movements were so rapid that actually during the entire operation and until arrival of VIII Corps on 18 August we had nothing on our flanks but Germans and no supporting troops within a day's motor march after Wednesday, 2 August.

On this day, a new world seemed to open up to the division. We had elbow room, we could stretch. It began to dawn on us that we actually owned *all* roads in Brittany, that the constriction of two to four divisions on a single road was over. The cavalry spread far and wide. The columns sped, hit, bounced, detoured and were off again.

The French caught the spirit of it. On Wednesday they rather timidly waved, by



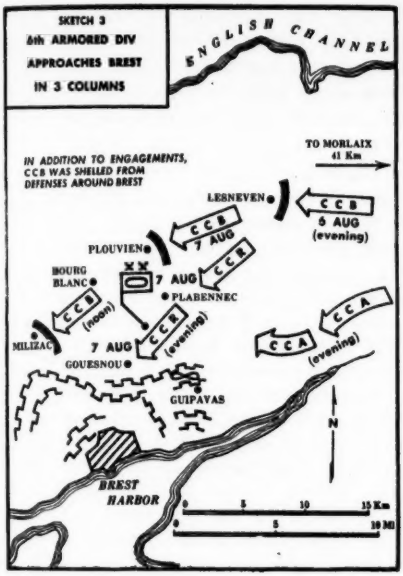
Thursday evening groups of FFI were on the street with weapons as soon as we appeared, by Friday night, on the long night march, armed FFI road guides were posted ahead of us, and information was actually coming in from the front. By Saturday the country was rising in arms, crudely organized but willing and enthusiastic, particularly eager to accept the German prisoners that were too numerous for us to manage. It was amazing to see and feel a whole population rising to the surface on the appearance of the dirt begrimed American soldiers.

Most of the German inland garrisons "retired" as fast as they could to the seacoast fortresses. But surprise and speed overtook them and there were daily fights by the cavalry and both columns, as shown on the sketch, and attested by the figures. On 2 August we had thirty-four casualties, captured 150 and destroyed six aircraft guns and an 88. On 3 August we had twenty-one casualties, captured 318, destroyed seven guns and two planes. On the 4th and 5th we lost about 100 men but destroyed seven guns and inflicted double casualties. On the 6th we lost forty-four men, killed and captured over 100 and destroyed a German armored car, five guns, and three "beetle tanks." On the 7th our losses were again over forty while we destroyed a big antiaircraft warning system outside of Brest, knocked out three guns and inflicted many enemy casualties. This was all preparatory to the major engagements at Brest.

History records that we did not capture Brest. Why? It is interesting to ponder briefly over the "ifs."

In midafternoon Thursday, 3 August, CCA on the left failed to turn west at Gael, continuing southwest on Mauron where it ran into an enemy battalion whose resistance forced a considerable deployment, and the subsequent attack and reassembly delayed CCA until late evening. In the meantime CCB, to the north, had struck only small resistance at Broon and by late afternoon had sped to the west some twenty miles beyond CCA. While observing CCA's attack at 1600 the Division Commander received by officer courier a longhand order written on scratch paper directing the advance to the west to halt in place; a force to be dispatched to capture Dinan (which CCB had hit the day before, driving in the outpost; then, confronted by a strong defense and an impassable river gorge, had by-passed). We never learned the reason for the order. The following day (4 August) the order was revoked at noon, but CCA had already moved out toward Dinan to its right rear and it was evening before the advance could be resumed. This loss of twenty-four hours allowed enemy reinforcements to reach Brest including a new commander.

The second "if" was a tactical incident. In order to avoid large towns which were known to be garrisoned and to approach Brest by routes where no terrain obstacles existed, both columns cut northwest from the Carhaix area, crossed the main north coast highway between Morlaix and Landivisian, turned west and struck Brest from the north and northeast. Due to terrain difficulties and some resistance CCA on the left was behind on 7 August when CCB in spite of greater distance and considerable opposition, hit the outer defenses of the city northwest of Gouesnou. As it proved later, CCB hit the strongest enemy position while the "gate" was relatively open to the northeast on that day. If CCA could have hit on the 7th the surprise would have been complete, and there is a strong possibility that it could have forced its way in along the route by which the 2d Division eventually became the first unit to get into the city over six weeks later. Before the entire division could be in position for a coordinated attack on the 9th, the Germans had "closed the door" and the 266th German Division from



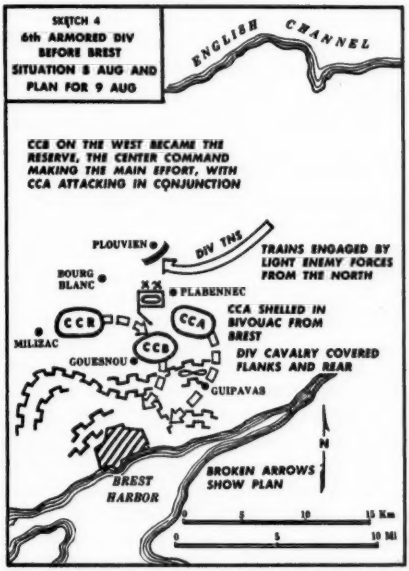
Morlaix was behind us as will be told later. The opportunity for a sudden seizure of the great Brittany port city was gone.

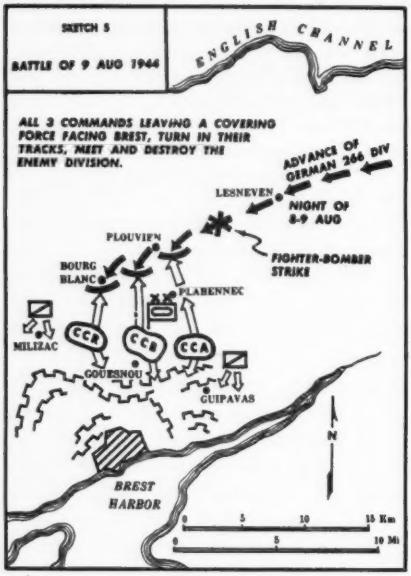
Never had a maneuver enjoyed better weather than our operations since the breakthrough. In addition, the bright full moon of the first week in August made it possible to operate in strange country at night. We would have advanced every night if it had not been for the exhaustion of the troops. As it was we marched all night 4-5 August after the delay caused by the order of the previous day, trying to make up time and get to Brest "by Saturday night" as General Patton wished. The German 2d Paratroop Division at Carhaix blocked that ambition by forcing both columns to detour that city, and both had stiff fights on 5 and 6 August.

The Division CP had marched 229 miles in seven days, when just before dark it set up in the high hedge bordered fields three miles southwest of Plabennec. For two days we had carried our wounded forward because it was too far and too unsafe to send them to the rear. Army had pushed gas up to Pontivy, but for many supplies we had to go to the Avranches area. Corps was completely out of contact. We had lost all of our cub planes, mostly from poor landing fields. Even the band had been engaged in a fire fight defending a gas dump successfully. Messengers were lost, killed or captured on the long line of "communications."

Yet on Tuesday the 8th, one week after Avranches, the tired troops prepared for the assault on Brest in the morning.

CCB on the right was to become reserve and shift to the rear of the center in the morning. The commander of CCB took over the center column which had had only one battle since Bree on 1 August, and was to attack through Gouesnou. CCA was





to attack through Guipavas. The artillery, a total of five battalions, was posted to support all guns being able to reach the city.

One battalion of CCA suffered losses from artillery during the afternoon, and the artillery received counterbattery as it registered in the evening. In the meantime the cavalry was covering the flanks and rear. Intermittent small-arms fire to the north and northeast was heard during the day. The trains moving into Plouvien were fired upon by small arms and artillery from the rear! Something was building up in the north. The absence of cub planes and the presence of the highest hedges we ever encountered made visual observation extremely difficult. About dark—2230 hours—the mystery was solved by the capture of Lt. General Spang, Commander of the 266th Division, who drove his car into an artillery position from the rear. His division which we bypassed at Morlaix was marching towards us from the rear trying to get to Brest! All through the night small-arms fire burst from every hedgerow around the division CP, the PW cage and all along the rear.

That proved to be the final "if" in our failure to capture Brest. Orders were issued during the night for all commands to leave a screen facing Brest, to reverse their directions, attack north in the morning, destroy the enemy in our rear and secure and assemble in the Plouvien area.

The battle of 9 August was a massacre. CCB in the center, led by 15th Tank Battalion and the 9th Infantry hit the enemy main body (896th, 897th, and 898th Infantry) killed over 200 and captured 1000. CCR on the west (now the left) flank struck an enemy column at Bourg Blanc where the 50th Infantry with some of the 69th's tanks destroyed the heavy weapons company of the German 851st Infantry, other mortars, machine guns, and an 88. CCA on the other (east) flank with the 68th's Tanks and the casualty-depleted 44th Infantry caught part of the enemy at Plouvien and completed the debacle. A group of our fighter bombers joined in the action and completely wiped out a column of enemy trains and artillery on the Plouvien—Lesneven Road.

The remnants of the German division were gathered in during the ensuing two days. Our artillery enjoyed the unique experience of having some batteries firing south against Brest, and some north at the same time. The cavalry which had covered the division rear during the all-night skirmishing pulled to the flanks and extended the cordon about Brest preventing the Germans from entering or leaving the city.

On the afternoon of 9 August a battalion of the 28th Infantry, 8th Division, arrived by truck from Rennes and was given the mission of securing commanding ground near Guipavas to cover our projected re-

newal of the interrupted attack on Brest. The same day Task Force "A," of VIII Corps reached Lesneven, and although unable to assist in the Brest operation, was a great protection to our rear and covered the debarkation of supplies at the now enemy-evacuated Morlaix. But further attack on Brest was not destined for the 6th Armored. Before readjustments had been completed, orders arrived 12 August to merely contain the fortress with a single Combat Command and move the balance of the division to Lorient.

The speed, determination and skill of the units of the 6th Armored Division in its advance on Brest 1-7 August 1944 were unexcelled, particularly when it is realized that every man knew we were completely on our own, surrounded by an enemy vastly superior in numbers, albeit of inferior mobility. To this is added that amazing battle of 9 August when the division, in position for an attack at daylight, was reversed 180° and attacked to the rear at the same hour and completely annihilated a less mobile enemy division.

The division losses for the period of this narrative: killed: 130, wounded: 398, missing: 70. Combat vehicles lost: 50, other vehicles: 62, guns: 11. Enemy captured: 3,715.

Some conclusions which we drew from this campaign as applicable to a highly mobile unit operating against a less mobile enemy are:

A rapid advance is automatic flank protection. Only when you halt must you specially protect flanks.

Deployment must be automatic when the head is stopped, it must be fast, wide and bold.

If you are more mobile than the enemy, never waste your time butting into stone walls.

Everybody must know how to fight. Our bridge company at the rear of the trains captured many prisoners by skillful, stealthy foot-work and use of individual arms. Our band leader manned a tank and drove off an enemy raiding party. All elements of Division Headquarters were in repeated fights.

Fire is terrifying, but when coupled with movement it is doubly so. That is why mounted action with guns blazing is so effective.

Falaise Gap, Mortain and the dash toward Paris held the spotlight during this period so that the isolated exploits of a single division were little noted. However the operations of the 6th Armored Division in Brittany can well be considered a classic example of a separate division in exploitation. The lessons learned were put to good use eight months later when the same battalions planted their flags 800 miles east "as the crow flies" on the Saxony hills beyond Chemnitz.

It is in time of peace that this Nation must preserve a balanced, adequate measure of our land, sea and air power lest we lose the peace we have so dearly bought.

General of the Army Dwight D. Eisenhower

Organization for
Military Psychological Warfare
in ETO

Colonel H. D. Kehm, *Field Artillery*
Instructor, Command and Staff College

This is the second of three articles on Psychological Warfare by Colonel Kehm. The first article appeared in the January 1947 issue of the Military Review. The third article will be published in the March 1947 issue. —THE EDITOR.

DURING World War II, psychological warfare agencies in the European Theater were charged with conducting operations against the enemy armed forces by leaflet, radio, loudspeaker and clandestine means. They were also charged with furnishing intelligence, guidance and administrative assistance to the civilian information and propaganda agencies of allied powers. It also fell to their lot to assist the indigenous populations of liberated countries to restore their information sources; press, radio, motion pictures, books and periodicals, and to control the operation of these activities in occupied enemy territory. These tasks called for a knowledge of and adherence to United Nations and national policies. Their accomplishment required the services of highly specialized personnel and much special equipment.

Zone of the Interior

In the United States psychological warfare was an important concern of four agencies;—The Joint Chiefs of Staff, the State Department, the Office of War Information and the Office of Strategic Services. The Coordinator of Inter-American Affairs (CIAA) was concerned to insure that there was coordination of activities under his control with US operations elsewhere in the world, and that his agency was not "scooped" in Latin America by those of rival countries. We have already noted that there can be no sharp delimitation between "political" and "military" psychological warfare. Therefore, some overlapping and divided control was inevitable. Much of the duplication which occurred could and should be avoided in a future emergency.

The State Department naturally was the source of political policy and guidance. Military guidance was left with the Joint Chiefs of Staff. In view of the potential conflict in requirements for men, supplies and transportation, the Joint Chiefs of Staff were also given the authority to pass on propaganda plans applicable to theaters of operations. Theater commanders were given control of such operations in areas under their command. The Office of War Information was the transmitting agency for policies. It initiated the general psychological warfare plans for various areas. It conducted practically all political (sometimes called strategic) psychological warfare and provided policy direction and, as we will note later, a large proportion of the personnel and some of the means for military psychological warfare.

From the policy point of view this plan had certain obvious drawbacks, but it

was worked out with no more than the ordinary number of headaches.

Within the War Department, the ultimate solution was a small and junior section in G-2 which had the function of representing the War Department at policy meetings of OWI and CIAA, and coordinating psychological warfare matters with other War Department and joint agencies. Major plans and policies were referred to the JCS through the usual channels. OSS had officers charged with similar functions as an integral part of its organization.

Organization Problems in the ETO.

Personnel

Before going into detail it is well to consider the general nature of some of the problems which shaped the organizations. The personnel employed was both civilian and military; male and female. Civilians were employed for operations with combat units. The civilians came from OWI and OSS and similar British agencies. The military personnel came from OSS and similar British organizations and from Army units (British, Canadian and U.S.). The British Navy, the U.S. Navy and the U.S. Marines were also represented. At least one stateless person and one officer, who had been a German prisoner before he became a member of the U.S. Army, were also found in this strange coterie of specialists. The problems presented by such a situation are apparent.

This complex personnel situation resulted from the unusual nature of the skills required, and because there was no quick and simple way of bringing properly-qualified people into the armed forces. A consideration of the tasks undertaken will show that the knowledge and skills required were such as are ordinarily achieved only after many years of experience. Advertising; radio programming, engineering and management; publication of newspapers and periodicals; motion picture production, selection and distribution; complete fluency in foreign languages and the ability to write well, are some of these skills. Only the last two are virtually independent of age and experience. Most of the others are found only in mature persons. The result is that a relatively small number of such persons was secured by selective service. Accordingly, many specialists could be secured only in a civilian capacity. Doing so also freed those with these skills who did come under selective service drafts for other duties in the military service where those same skills were needed.

This admixure of people led to many injustices as to pay, privileges and obligations. Since there could be no common loyalty and common indoctrination, differences and difficulties did arise. Those statements constitute no reflection on the classes of persons involved. In many cases the civilians were exempt from selective service, and voluntarily gave efficient loyal service of the highest order at heavy financial loss to themselves. In some cases, military personnel proved unreliable and inefficient. Obviously, there were many civilians who took unwarranted advantage of their status, and many military persons did the same. Differences in control and affiliation aggravated the resulting problems. They were solved, but at the expense of considerable loss of efficiency. There is no doubt that an operation conducted and controlled entirely by military personnel would be more efficient and more effective. The tasks undertaken, and the personnel policies in effect at the time, made it impossible to achieve this desirable condition.

Logistics

The logistical implications of a psychological warfare campaign can also become enormous. If it involves mobile printing and broadcasting facilities, large and

heavy vans are required. The supply of paper is a constant headache. When, as in World War II, this item is scarce, a very definite question of priorities is involved. If fixed radio transmitters must be established, a tremendous job of moving equipment and in construction comes into the picture. When movies, news sheets, periodicals and posters are involved, time is critical because such items are often worse than useless when they are out of date.

Communications

The communications load is also a heavy one; large volumes of material must be transmitted. Much of it is classified. In many cases, particular intelligence items or interpretation of policy require a high priority to achieve good results. It is sometimes difficult to convince harassed logistics and communications personnel that such materials need prompt attention just like any other form of ammunition.

These background considerations will make it easier to see the "why" of the organizations found within the theater.

The SHAEF Organization

At SHAEF, psychological warfare was controlled through a special staff division, the Psychological Warfare Division (PWD) under Brigadier General R. A. McClure. This division resulted from a splitting of what had been G-6, Psychological Warfare and Public Relations. PWD was integrated, British-American, like all other staff divisions in SHAEF. It did not habitually operate under the supervision of any G-Section. The Deputy Chief of Staff came most nearly being the "father confessor" of the division. Problems were solved in consultation with the division most concerned. Naturally these were G-2, G-3 and G-5 (civil affairs). The Political Advisors were constantly consulted.

The G's themselves were quite aware of the capabilities of this weapon and lent excellent support. In one or two cases some of the super-military subordinates had to be "convinced" by their division chiefs that the fullest intelligence and knowledge of future plans was essential.

In broad terms the functions of the division turned out to be:

1. Advise planning agencies on the psychological aspects of contemplated operations.

2. Propose and prepare psychological warfare operations to support and exploit military campaigns and operations.

3. Present to the civil agencies the needs of SHAEF for political psychological warfare support.

4. Assist the civilian agencies in this field by advice and intelligence.

5. Prescribe policy on themes for military psychological warfare and insure coordination where applicable with national political policies.

6. Coordinate themes and operations as between army groups and other theaters in the war against Germany.

7. Provide assistance to subordinate commands in the form of special supplies and equipment not available from military sources.

8. Provide support by prepared leaflets, leaflet and news-sheet drops by strategic air force units, by radio broadcasts and by black operations.

9. Formulate the military aspects of policies for the reestablishment of information services in liberated areas and their control in enemy territory.

10. Organize and train personnel and agencies for psychological warfare and for information services control.

11. Assist the civil agencies in taking over the support of information services in liberated countries.

The control of personnel and equipment was forced on the division because of critical shortages and shifting needs.

The provision of intelligence to civil agencies, to subordinate units and to sec-

tions within the division became an extensive operation. It included the study of operational intelligence; document research; investigation of war crimes; interrogation of prisoners, civilians and displaced persons; radio monitoring and opinion polls.

The organization of PWD was along functional lines. Though it changed in detail from time to time, it included the following elements, in some form or other most of the time:

The Chief of Division and his deputies —this group represented the military and civilian agencies both British and American. It formulated major policy decisions for consideration by the Chief. It effected non-routine liaison with other elements of SHAEF and with the civil agencies.

An administrative section operated the offices. It included a personnel section found necessary because of the unusual status of so many individuals. The ordinary army agencies could not handle the civilian employees nor the special circumstances under which some of the military and naval members were serving.

A supply and transport section was required because of the fact that so many non-standard items were involved and because the supply procedures of the civil agencies, from whom a vast amount of these supplies came, did not fit into military systems.

Media sections dealt with technical problems in the various media. They assisted in the testing and selection of personnel. They formulated plans and policies applicable to their respective media for consideration by the Plans and Directives Section, the Chief and Deputies. The following sections were included: Leaflets, Radio (included public address systems and radio receivers), Publications and Posters, Press and News (monitoring and the preparation of a news file), Public Entertainment (including cinema, music theaters, etc.).

In many instances these sections were operational. Thus, the Radio section planned, and to a large extent executed, the seizure and reestablishment of Radio Luxembourg.

Plans and Directives Section. This section had the functions implied by its name. In addition it included a leaflet-writing group at one stage of operations. A small group of "black" specialists worked with this section.

Communications Section. This section arranged for the transmission of intelligence and directives between London, Washington, SHAEF and the Army Groups. It also handled the many matters relating to radio frequencies and the allocation of facilities.

Finance Section. This section handled the financial matters involved in the payment of civilian employees, and the disbursement of funds furnished by civil agencies for other purposes.

Liberated Areas Section. This group coordinated all operations in and involving the liberated countries.

German Operations Section. This group laid plans for the organization, training and operation of units to control the information services in Germany. The entire PW Division and most of the Army and Army Group agencies were absorbed in these units after hostilities ended.

Intelligence Section. As previously indicated, this section was operative in many fields. It controlled interrogators, opinion poll teams, research specialists and a group to study ordinary military intelligence for items of particular value for psychological warfare. It provided material both for the purely military phases and for the more nearly political aspects.

Training Section. This section was necessary in the early phases of operations to train and indoctrinate civil and military personnel.

Although the division was at times located quite far from SHAEF (Main)

daily liaison was effected with G-2, G-3 and G-5. There was almost daily liaison with the Chief or Deputy Chief of Staff and the Political Advisors. Similarly, close contact was maintained with representatives of the civil agencies in France and with London and Washington.

A small group was ordinarily present with SHAEF, forward.

The division was forced further and further into the operating business. In addition to the operating elements noted above, it also controlled the following:

The Allied Information Service, which provided the agencies, British and American, for reestablishing the information services in liberated countries.

Elements of two U.S. Army mobile broadcasting companies which will be discussed in greater detail later. These elements furnished personnel and equipment for interrogation, for communications and for operating fixed radio stations. Isolated personnel requirements in French and British armies were also met from this source from time to time.

The District Information Service Control Units. These were the agencies organized to control the information services in Germany and provide for their operation by reliable Germans. On the U.S. side these were organized and trained under PWD. On the British side PWD organized the units and then transferred them to 21st Army Group for final training and disposition.

The involvements of PWD, SHAEF, with civilian propaganda agencies were far greater than they would have been had there been a strong coordinated military agency in the War Department to assist the Theater Commander to meet his many problems.

Only a very small element was established in Headquarters ETOUSA. It was primarily an agency to coordinate the requests of SHAEF for U.S. Military resources and an aid to OWI in the conduct of those operations in the communications zone which it took over from PWD, SHAEF.

Army Group Organizations

The 12th Army Group agency was a large one. It was capable of extensive operation in radio, press, intelligence and leaflets with only limited outside help. It provided a central agency for the allocation of means such as loudspeakers and for coordinating psychological warfare activities of the subordinate armies.

The organization differed from the one at SHAEF in that it was a part of a special staff section which included public relations and censorship. This same plan was carried down to the armies under 12th Army Group. The union of psychological warfare and public relations in one special staff section, especially when it required pooling of resources, was not a happy one. This was due to many reasons, but primarily to the fact that the correspondents, some public relations officers, and many of the people engaged in psychological warfare were inadequately trained as soldiers to the realization of the need for teamwork and how to get maximum over-all help from military routines, organization and procedure.

The same type of organization existed in 21st Army Group (British) but on a much more moderate scale. Here, too, the feeling was that separation of the two fields was best. American resources were frequently employed to supplement the inadequate organization. Despite the limited resources, the quality of the operations conducted and of the intelligence secured was very high.

At 6th U.S. Army Group the organization was also very small. It was in effect a separate special staff section directly under the Chief of Staff.

The functions of the psychological warfare agency at the army groups paralleled those at SHAEF. Political involvements

were not nearly so important. They could, in fact, have been reduced below the extent to which they were allowed to rise. There was some tendency to go "big picture" instead of sticking closely to the line of military needs. Perhaps this broader approach paid off. Complete intelligence is not yet available on this point, but at this time the indications are overwhelming, that in field operations the basic, simple, military themes of straight news, promise of good treatment, and indication of circumstances and ways in which to "cease resistance" were most effective, and that the most efficient political psychological warfare was conducted through the normal press and radio facilities, in short from the fixed home stations.

Organization Within the Field Army

The original intention in the US Army was to provide a mobile broadcasting company (T/O&E 30-47) for each field army. However, when the number of armies was increased above that expected, this proved impossible. Furthermore, during the course of operations it was shown that the organization of the companies was not the most effective. There was too much radio, too little loudspeaker equipment and inadequate provision for shell loading, liaison (unit, air and artillery), translator and writer personnel. Pooling and reshuffling the resources was necessary and proved advantageous. Like the Joint Army-Navy Signal Companies, these companies never operated from one base. Elements were scattered over the major part of northwestern Europe.

Ordinarily, the psychological warfare sections set themselves up administratively apart from the main headquarters. This complicated mess, supply and transport. It should and could generally have been avoided. The reluctance of military headquarters to accept a polyglot military/civilian agency as an integral component, and the tendency on the part of many of the persons in the sections to consider their needs as "special," resulted in this unfavorable condition. It is significant that in one army, where the psychological warriors, after a very poor start, made a resolute effort to "earn their passage," they succeeded admirably and achieved outstanding results.

There were no fixed organizations with corps and divisions. Liaison officers from army units determined the needs of corps and divisions by frequent visits and secured suggestions and intelligence from them. As required, teams—particularly public address teams—were attached for particular operations. Military leaflets were prepared and delivered on request. Air drops of leaflets were arranged and requests for radio broadcast assistance were passed to the proper agencies. Experience indicated that a public address team per infantry division and one per armored combat command were highly desirable.

In addition, one psychological warfare specialist might well be permanently located at each corps headquarters. He should be fully informed of the procedure and technique of psychological warfare, and should be constantly apprised of the resources available at army and higher levels to provide assistance to his corps and its subordinate commands. This would not necessarily be a full time task; hence the specialist could be a member of the normal G-2 or G-3 sections.

Post-War

Naval Organization

— *The Operating Forces*

Rear Admiral Miles R. Browning, *United States Navy (Retired)*
Former Director, Naval Section, Command and Staff College

This is the third and final article on this subject by Admiral Browning. The two preceding articles were published in the December 1946 and January 1947 issues of the Military Review, and this article is a supplement to them.—THE EDITOR.

DURING the period of increasingly strained international relations which featured the middle and late 1930's and which finally culminated in the out-break of World War II in September 1939, the United States Navy was feverishly engaged in the effort to regain its operating strength after the strangulation of the preceding decade and a half. While the inevitability of the coming clash in Europe became daily more clear during those months, nevertheless our fleet dispositions were made, and the new units were assigned as rapidly as they left the shipyards, with a constant appreciation of the lurking menace to the west—Japan. Thus, as early as 1937, the Navy had foreseen the probability that the country was soon to be confronted with the task of conducting a war of world-wide tactical scope which would present problems radically different, both in their immensity and in their nature, from any previously encountered in its history. With our enemies on both sides of the globe, we would face the necessity for readiness to conduct major amphibious warfare in both the Atlantic and the Pacific, simultaneously. Hand in hand with that prospect there appeared the impending and staggering task of transporting, with adequate sea escort, the munitions and supplies which would be so desperately needed by our undernourished allies from Petsamo and Alexandria to Sydney and Calcutta. The structure of our Navy—and particularly that of the Operating Forces — required enormous strengthening and readjustment before it could hope to meet these new responsibilities. That this rehabilitation was accomplished successfully is now a matter of history, and the post-war composition and organization of the Navy's Operating Forces reflect clearly the lessons and experiences of the past four years of conflict. The entire frame-work as it now exists is readily susceptible of quick expansion or contraction and is sufficiently flexible to meet foreseeable contingencies of the future.

The Operating Forces of the Naval Establishment are comprised of its mobile combatant elements. The main components of the Operating Forces are the Fleets and the Sea Frontiers. In addition, there are the Naval Transportation Service, the Naval Air Transport Service (NATS), the Naval Communication Service, the Naval Intelligence Service, and certain fleet units assigned to the local defense commands. The Chief of Naval Operations (CNO) is charged with the over-all command of the Operating Forces, subject to the supreme authority of the President as

Commander-in-Chief of the nation's armed forces. The CNO is thus the country's principal Naval Executive. In the discharge of his responsibilities as such, he is also the naval executive member of the Joint Chiefs of Staff and he is accountable to that body for executing their directives insofar as they pertain to the Navy's Operating Forces.

The High Naval Operating Command

The CNO functions through a headquarters organization set up in the Navy Department and designated as The Office of the Chief of Naval Operations. This office includes, as its major functional components: a Vice CNO with the rank of Admiral and who is the principal advisor and assistant to the CNO; six Vice Admirals as Deputy CNO's whose titles and prime responsibilities are as indicated in Chart I; and a Naval Inspector General with the rank of Admiral. These officers, together with their assistants, comprise, in effect, the general staff of the Chief of Naval Operations.

The Vice CNO performs functions closely akin to those of the Chief of Staff in any major military or naval command. He succeeds to the duties of the CNO in the latter's absence, and this succession is further continued down through the six Deputies, in the order of their personal precedence in rank, should both the CNO and the Vice CNO be absent. However, although the Vice CNO serves as the coordinator and the normal channel between the CNO and the Deputies, it is noteworthy that the latter are required to report directly to CNO, as well as through the Vice Chief. The Naval Inspector General reports directly to CNO on any matter within his purview or in connection with any special assignment he may receive from that officer.

In addition to the Deputies, the Vice CNO has directly under him a staff organization designated as the General Planning Board (see Chart I). This board is an extremely important cog in the functioning of the Office of CNO, since its major duty is to coordinate the programming functions of the Deputy CNO's and to integrate the planning thinking of the entire staff organization. The board is responsible for advice, recommendations and assistance in strategical planning of whatever nature, and for the development of the logistical support plans required thereby. The board's functioning in these respects is thus based primarily upon the directives which are issued by the Joint Chiefs of Staff to the CNO. As a corollary, the board is also responsible for the logistical support aspects and plans of, and for, any recommendations which CNO may desire to submit for consideration of the Joint Chiefs of Staff.

The functions of the six Deputy CNO's, and those of the Naval Inspector General, are outlined briefly in the following paragraphs. In the case of each responsibility outlined, the functioning of the Deputy charged therewith is required to be in conformance with a program or plan which has been decided upon by CNO pursuant to a Joint Chiefs of Staff directive.

Deputy CNO, *Personnel*, is directly charged with responsibility for personnel logistic plans and policies, and with the coordination of *basic* training of all naval personnel.

Deputy CNO, *Administration*, is responsible for all general administrative matters within the Office of CNO. His principal other duties include supervision over the Naval Communications Service, the Naval Intelligence Service, all outlying island Naval Governments, Naval District Administrative Affairs, and the direction of and supervision over Pan-American Affairs and all U.S. Naval Missions to foreign countries.

Deputy CNO, *Operations*, is charged with the paramount duty of formulating strategical plans, policies and programs.

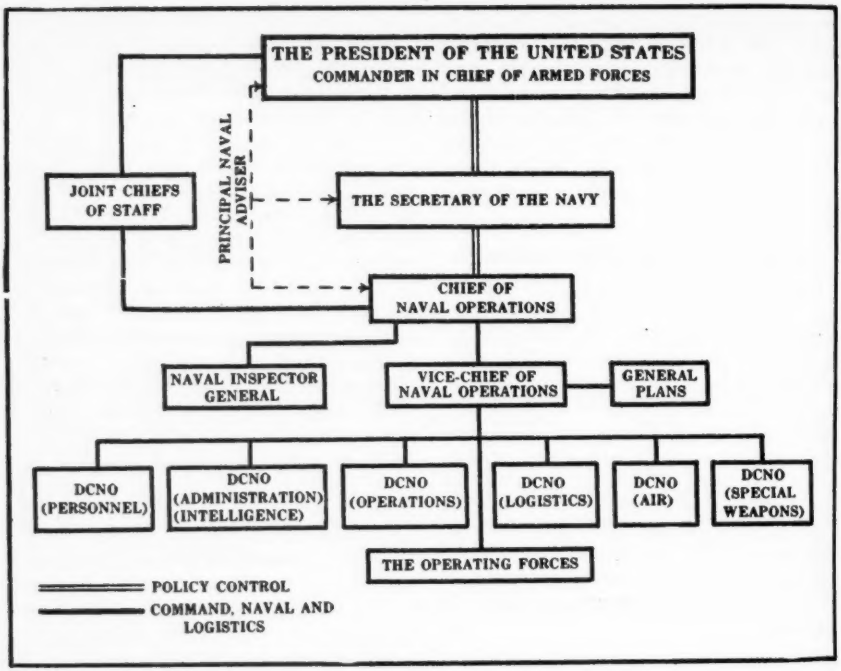


Chart I.

He has, in addition, direct cognizance over the organization, administration, readiness and operations of the fleets, the sea frontiers and naval command areas beyond the continental limits.

Deputy CNO, *Logistics*, is specifically responsible for the formulation of logistic plans and policies to support the Operating Forces, and for supervision over their execution. Broadly speaking, he directs and coordinates the activities of the Bureaus of the Navy Department in the furtherance of these support plans, with the exception of those pertaining directly to Naval Aviation, in which sphere, the Deputy for Air performs parallel functions.

Deputy CNO, *Air*, is charged with supervision over the military aspects of Naval Aviation as to over-all planning, and, as noted above, logistic support. In these matters, he establishes policies and program requirements. In addition, he is directly charged with responsibility for the effective integration of Marine Corps Aviation with, and as a part of, Naval Aviation. To this end, he has a Marine Aviation Major General assistant.

Deputy CNO, *Special Weapons*, is responsible for all matters pertaining to the coordination of research, development, test and evaluation of new weapons, devices and equipments. Materials, installations and procedures for the development and use of atomic energy and guided missiles are specifically included within his purview. As a matter of interest, the Deputy CNO, Special Weapons, Vice Admiral Blandy, and his principal assistant, Rear Admiral Parsons, were assigned ad-

ditional duty as Task Force Commander and Deputy Task Force Commander, respectively, of the joint task force employed in Operation Crossroads.

The Naval Inspector General, in conformity with his title, is given wide latitude in his authority to make inspections and investigations of and into all matters affecting the efficiency and economy of the various components of the Naval Establishments. Every naval activity is subject to his scrutiny in the performance of his normal duties. As we have noted previously, he reports only to the CNO, himself.

The preceding discussion has concerned itself with outlining, in broad terms, the organization and functioning of the top-level naval operating command. Looking now at the geographical disposition of the Operating Forces, themselves, we can obtain a bird's-eye view of the giant chessboard and the men upon it with which CNO implements the national naval policy and the directives which he receives from the Joint Chiefs of Staff.

The Sea Frontiers

We have noted the fact that the main components of the Operating Forces are the Fleets and the Sea Frontiers. Turning to the latter for the moment, they may perhaps be more clearly comprehended from the viewpoint of an Army man if they are considered as "Coastal Defense Zone Organizations." While this term is not an officially approved one, it does describe their functions and nature quite accurately and completely. There are, currently, seven Sea Frontiers, of which three are located along the coasts of the continental United States and four in outlying areas. They are as follows (refer to Chart II):

1. The *Eastern* Sea Frontier, with headquarters of the Commander in New York City, comprising the coastal area and adjacent sea areas along the entire Atlantic coast of the United States from and including Maine to, but *not* including, Florida. It is subdivided into four sectors, viz:

New England Sector,
New York—Philadelphia Sector,
Chesapeake Bay Sector,
Carolina Sector.

2. The *Gulf* Sea Frontier, with headquarters in New Orleans, comprising the coastal area and adjacent sea areas of both the Atlantic and the Gulf shores of the Florida peninsula and the Gulf coasts of the United States, Mexico and Western Cuba. The Gulf Sea Frontier is not subdivided into sectors.

3. The *Western* Sea Frontier, headquarters San Francisco, comprising the coastal area and adjacent sea areas of the entire Pacific coast of the United States, Lower California and Mexico. It is subdivided into three sectors.

Northwestern Sector,
Northern California Sector,
Southern California Sector.

4. The *Caribbean* Sea Frontier, headquarters San Juan, P.R., comprising the coastal areas and adjacent sea areas of the West Indies (except western Cuba), Venezuela and the Guiana's. It is subdivided into four sectors:

Guantanamo (Cuba) Sector,
Puerto Rico Sector,
Trinidad Sector,
Aruba-Curacao Sector.

5. The *Panama* Sea Frontier, headquarters Balboa, comprising both the Atlantic and Pacific coastal areas and adjacent sea areas of Central America, the Isthmus, Columbia, Ecuador and the Galapagos Islands. It is subdivided into two sectors:

Atlantic Sector,
Pacific Sector.

6. The *Hawaiian* Sea Frontier, headquarters Pearl Harbor, comprising the coastal areas and adjacent sea areas of the Hawaiian Island chain and extending south to include Jarvis Island, just south of the equator. It is not subdivided.

7. The *Alaskan* Sea Frontier, headquar-

NAVAL FORCES
IN EUROPEAN
THEATER
12th Fleet
ATLANTIC FLEETS
4th—Reserve Training
8th—North Atlantic
10th—South Atlantic and
Caribbean
CARIBBEAN SEA FRONTIER
EASTERN SEA
FRONTIER
Navy Department
GULF SEA
FRONTIER
PANAMA SEA
FRONTIER
WESTERN SEA FRONTIER
19th Inactive
ALASKAN SEA FRONTIER
HAWAIIAN
SEA
FRONTIER
PACIFIC FLEETS
3d—Reserve Training
5th—Eastern Pacific
7th—Western Pacific

Chart II.

ters Kodiak, comprising the coastal areas and adjacent sea areas of Alaska and the Aleutian Islands. It is subdivided into five sectors:

Sitka Sector,
Kodiak Sector,
Unalaska Sector,
Adak Sector,
Attu Sector.

Within each of the Sea Frontiers, there are organized the following Frontier Defense Forces, whose activities are coordinated by Frontier headquarters:

Anti-submarine Forces,
Inshore Patrol,
Offshore Patrol,
Escort Forces,
Attack Forces.

In addition, each Sea Frontier performs logistic support functions for that Fleet which is operating in the contiguous ocean area. In the case of the Pacific area, as a glance at Chart III will show, two of the Sea Frontiers—the Hawaiian and Alaskan—are incorporated directly into the Pacific Fleet organization. Also, the Western Sea Frontier is so incorporated for *logistic support functions only*. These features of the organization are dictated by the vastness of the Pacific operating areas and the remoteness of outlying bases; they are not duplicated in the Atlantic and Panama, where all Sea Frontiers are controlled directly by CNO and are not subject to the Fleet Commander in Chief's orders.

The Fleets

The main fleet strength of the United States is divided between the Pacific Fleet and the Atlantic Fleet. The former comprises all active fleet units in the Pacific, plus the Sea Frontiers noted in the preceding paragraph. The Atlantic Fleet comprises all active fleet units in the Atlantic and the Gulf of Mexico, *except* those specifically and individually assigned by CNO to operations in European waters under the Commander, Twelfth Fleet. The Twelfth Fleet is a temporary and elastic task fleet, under direct control of CNO, assigned to German waters, the Mediterranean, Azores Islands, etc.

In addition to the above three *active* Fleets, there are two *inactive* Fleets and those fleet units (mainly transport types and small craft), which are assigned to the Naval Transportation Service, Naval Air Transport Service, and to miscellaneous or special independent duty. All such units are administered and operated directly under CNO. The two *inactive* Fleets are immobilized in the ports along the Atlantic and Pacific continental coasts. The 16th Fleet is located on the Atlantic seaboard and is controlled by CNO, acting through the Commander Eastern Sea Frontier. The 19th Fleet is located on the Pacific seaboard and is similarly controlled by CNO, acting through Commander Western Sea Frontier.

Returning now to consideration of the two main active Fleets, i.e., the Pacific Fleet and the Atlantic Fleet, we find that each is commanded by an officer designated as Commander in Chief. The authority implicit in the title is considerably greater than that vested in a Fleet Commander not so designated, and the reason for the use of the title and the need for the increased authority becomes clear when the dual organization frameworks of the two commands are understood.

The Pacific Fleet comprises a *type* (but *not* a *tactical*) organization which embraces all the mobile units and which is called the *First Fleet*, together with the *Support Elements* which include the outlying Sea Frontiers, the Western Sea Frontier for logistics only, and the island and foreign occupied bases of the western Pacific. In addition to the type organization of the mobile units as the First Fleet, these same units are assigned to three tactical or task organizations designated as the *Third*, *Fifth* and *Seventh*

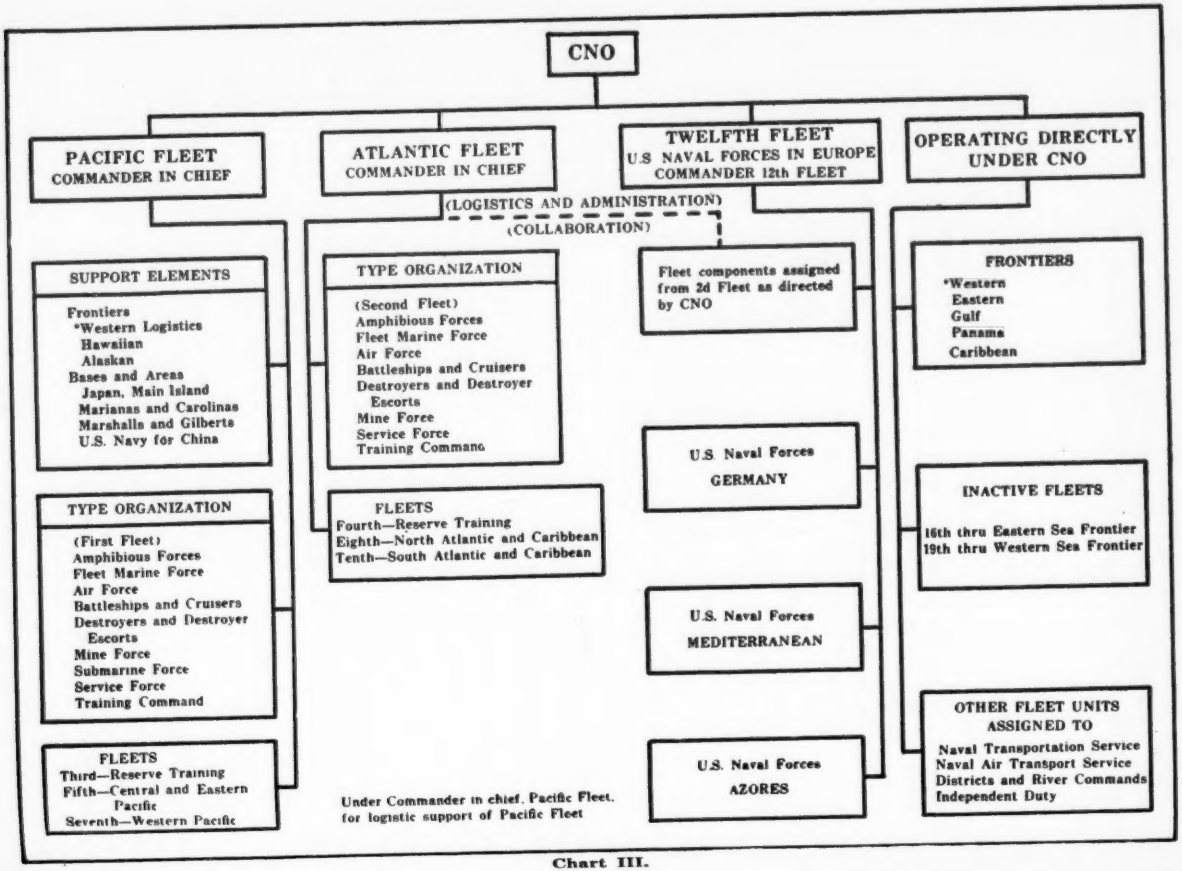

CNO
PACIFIC FLEET
COMMANDER IN CHIEF
ATLANTIC FLEET
COMMANDER IN CHIEF
TWELFTH FLEET
U.S. NAVAL FORCES IN EUROPE
COMMANDER 12th FLEET
OPERATING DIRECTLY UNDER CNO
(LOGISTICS AND ADMINISTRATION)
(COLLABORATION)
SUPPORT ELEMENTS
Frontiers
*Western Logistics
Hawaiian
Alaskan
Bases and Areas
Japan, Main Island
Marianas and Carolinas
Marshalls and Gilberts
U.S. Navy for China
TYPE ORGANIZATION
(First Fleet)
Amphibious Forces
Fleet Marine Force
Air Force
Battleships and Cruisers
Destroyers and Destroyer Escorts
Mine Force
Submarine Force
Service Force
Training Command
FLEETS
Third—Reserve Training
Fifth—Central and Eastern Pacific
Seventh—Western Pacific
TYPE ORGANIZATION
(Second Fleet)
Amphibious Forces
Fleet Marine Force
Air Force
Battleships and Cruisers
Destroyers and Destroyer Escorts
Mine Force
Service Force
Training Command
FLEETS
Fourth—Reserve Training
Eighth—North Atlantic and Caribbean
Tenth—South Atlantic and Caribbean
Fleet components assigned from 2d Fleet as directed by CNO
U.S. Naval Forces GERMANY
U.S. Naval Forces MEDITERRANEAN
U.S. Naval Forces AZORES
Under Commander in chief, Pacific Fleet, for logistic support of Pacific Fleet
FRONTIERS
*Western
Eastern
Gulf
Panama
Caribbean
INACTIVE FLEETS
16th thru Eastern Sea Frontier
19th thru Western Sea Frontier
OTHER FLEET UNITS ASSIGNED TO
Naval Transportation Service
Naval Air Transport Service
Districts and River Commands
Independent Duty

Chart III.

Fleets. Chart III shows this dual framework and, together with Chart II, indicates the general nature of the employment of these three task fleets and the general areas in which they normally operate. The Third Fleet conducts reserve training; the Fifth operates generally in the eastern portion of the Pacific; and the Seventh generally in the western portion. Each of these task fleets is commanded by a Fleet Commander whose primary responsibilities are operational—not administrative—since each unit of his task fleet is also a unit of one of the type commands of the over-all type organization (the First Fleet), and looks to the appropriate Type Commander there for normal administrative guidance.

The Atlantic Fleet organization parellels that of the Pacific with a few differences which result naturally from the variations in the two operating theaters. The Atlantic Fleet is type-organized as the *Second* Fleet, similar to the Pacific First Fleet, but, unlike the Pacific practice, the Commander in Chief does *not* command the Support Elements, i.e., the contiguous Sea Frontiers and the outlying bases. The tactical or task grouping of the Second Fleet is exactly similar to that in the Pacific, in that there are three task fleets, the *Fourth, Eighth* and *Tenth.* The Fourth conducts reserve training, the Eighth operates normally in the North Atlantic and the Caribbean, and the Tenth operates normally in the South Atlantic and the Caribbean. Fleet operational command and type administrative command channels are the same as those already outlined in the case of the Pacific. The Commander in Chief, Atlantic Fleet, has an additional responsibility with respect to those units, basically assigned to his Second (type) Fleet, which are ordered by CNO, from time to time, to duty under Commander Twelfth Fleet in European waters. While so detached from his immediate purview and his operational control, he is required, nevertheless, to provide for their logistic support and administrative control through the medium of collaboration with Commander Twelfth Fleet.

It is hoped that the above discussion, together with the three accompanying charts, may serve to clarify the Army reader's picture of how our Navy arrives at its "Order of Battle," and of why it does so in that manner.

There are some people who claim that the atomic bomb now makes navies obsolete. That has been claimed for every other new weapon, from the smooth-bore gun to the armor piercing shell. The submarine and the airplane forced changes in navies, and the atomic bomb will force compensating changes in the design and operation of ships.

But while the prophets of naval doom are shouting themselves hoarse, the Navy will be at work to make the changes needed to accommodate American sea power to the new weapon, a process that has taken place following the advent of each new weapon throughout the centuries. The American genius for the exercise of sea power will not be allowed to languish.

Fleet Admiral Chester W. Nimitz

The

3d Infantry Division

Crosses the Meurthe

Lieutenant Colonel W. B. Rosson, *Infantry*
Instructor, Command and Staff College

The Situation

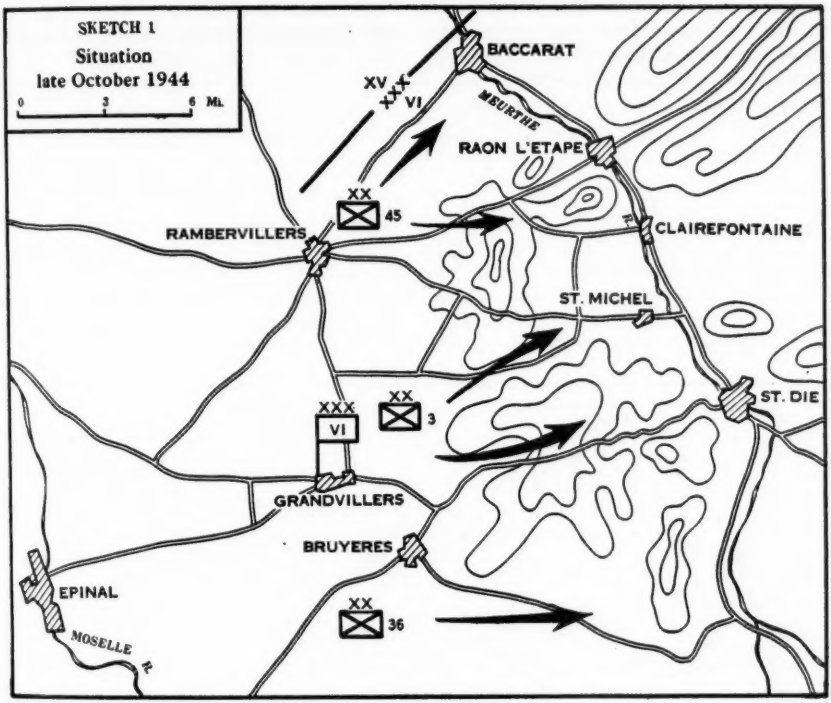
SOME insisted the whole affair was a "lucky break." Others chalked it up to real "savvy." One unimpeachable authority serving with the 3d Platoon of Charlie Company claimed that, as in golf, "They don't ask you how you got there, just how many."

In any event, General O'Daniel's 3d Infantry Division pulled a night sneak across France's swollen Meurthe River under the very nose of the Boche who was holding forth on the far bank. This little show was run off on the night of 19-20 November 1944, and despite a variety of difficulties, undoubtedly constituted one of the most cleverly conceived and professionally well conducted performances on the fall program of the ETO.

October 1944 found the VI Corps ploughing to the east and northeast from the Moselle River in the region generally northeast of Epinal, France. The going was tough—ask any doughboy from the 3d, 36th, or 45th Infantry Divisions. The enemy was using the heavily wooded, rolling country to excellent advantage in resisting the advance of VI Corps and its neighboring units, the First French Army to the south and east, and the XV Corps to the north. Scattered rains had set in, and the first real touches of winter cold accompanied them. The Veterans of the 1943 campaign in Italy began to sense that a similar ordeal lay ahead. To build an even better case for those "doughs" who were firm advocates of the theory that "war is hell," these same VI Corps soldiers had fought steadily without relief since the landings in Southern France on 15 August 1944. Nevertheless, the Corps was slugging ahead toward the next objectives of any consequence — the Meurthe River and the famous old French city of St. Die. Behind these lay the formidable Vosges Mountains which no major military force in history had ever crossed against opposition. Sketch 1 shows the general situation of the VI Corps as of the end of October.

November, however, ushered in another development. Seventh Army cooked up a strong arm play to capture Strasbourg and destroy the enemy west of the Rhine River in its zone. Among the features of this plan were the transfer in early November of the 45th Infantry Division from VI Corps to Army Reserve, then to XV Corps on the north, and the introduction to VI Corps—and combat—of the 100th and 103d Infantry Divisions.

By 10 November the 100th Infantry Division had replaced the 45th Infantry Division on the left (north) flank of VI Corps, and was mixing it up with the enemy in the Baccarat area. By the same date the 103d Infantry Division was within one day of completing the relief of the right (southern) two regiments of the 3d Infantry Division in the wooded country



overlooking the Meurthe River immediately west of St. Die. These two 3d Infantry Division regiments, the 7th and 30th, were to move back to assembly areas in the Autrey—Fremifontaine—Ste. Helene area for rest and rehabilitation. Both regiments would be relieved and in assembly areas by daylight, 11 November. The artillery and most of the attached tanks and tank destroyers of the 3d Infantry Division were due to remain in position alongside their 103d Infantry Division counterparts for forty-eight additional hours.

The remaining 3d Infantry Division regiment, the 15th Infantry, was moving ahead slowly but surely in its mission of clearing the northern portion of the 3d Infantry Division zone to the west bank of the Meurthe.

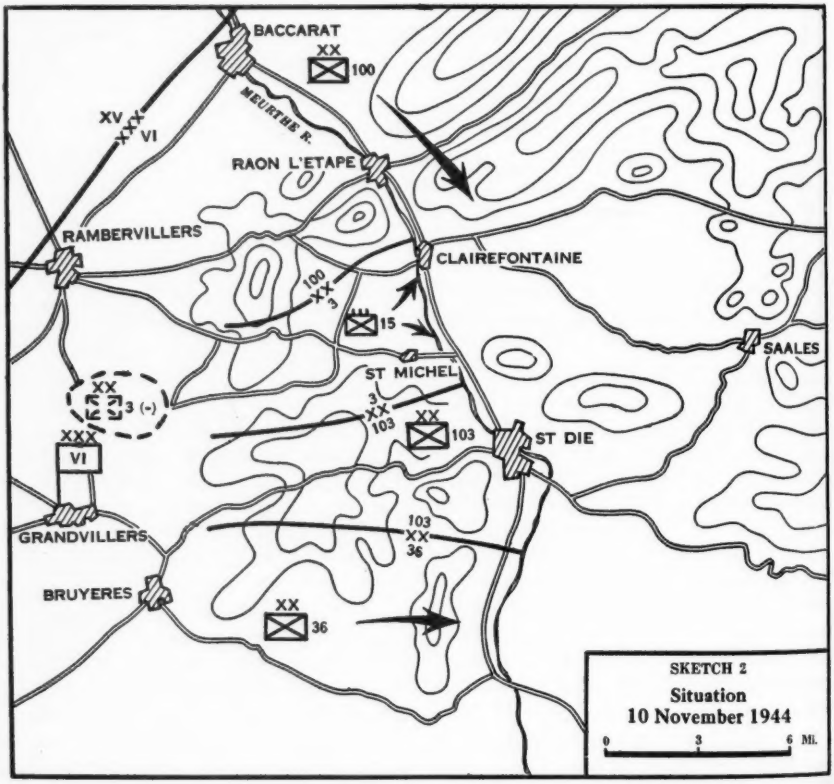
The 36th Infantry Division, meanwhile, was shouldering ahead to the Meurthe in the area south of St. Die against stubborn resistance. See Sketch 2 for a graphic representation of this 10 November picture.

The Plans and Preparations

Now, suppose we drop in on the VI Corps CP at Grandvillers on the afternoon of 10 November. All the division commanders with certain staff officers have assembled to hear the details of the Corps Commander's plans for a forthcoming attack to the east, as part of

the Seventh Army offensive. Later on in the afternoon we leave the corps command post fired with a zest for battle and armed with several written plans of action due to be executed on or about 20 November. Reduced to simplest factor terms, these plans provide for a general Corps scheme of maneuver as shown in Sketch 3. Note particularly that the 3d Infantry Division is scheduled to force a crossing of the Meurthe as its part in the Corps plan.

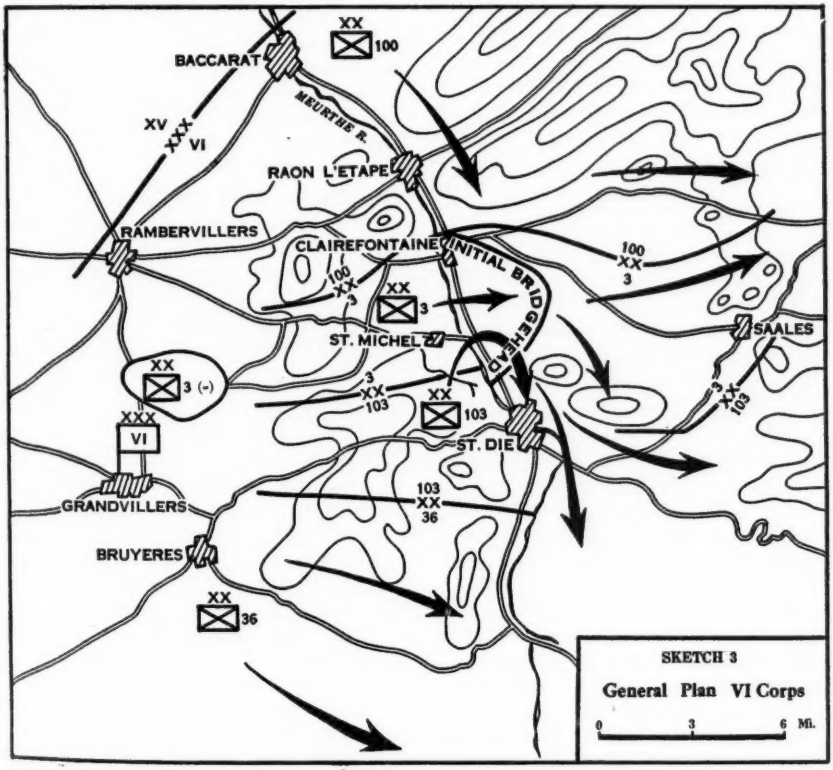
The Commanding General 3d Division must have recalled about this time that his "Marnemen" had not staged a full-scale major river crossing since the Volturno, in Italy in October of 1943. Nevertheless, we can be sure that the forthcoming operation offered a first-rate challenge to the Commander and his troops. That night he held a staff conference at which he indicated that as soon as the division command post opened in Autrey the next day, 11 November, planning would be initiated in earnest. He told G-3 that he expected to place his own preliminary



plan in the hands of his subordinate commanders by 12 November—the same day on which the Commanding General, 103d Infantry Division would assume command of his new sector, thereby leaving the 3d Infantry Division a one-regiment sector alongside the 103d Infantry Division and to the north, fronting on the Meurthe in the St. Michel—Clairefontaine area.

At the new command post on 11 November, the division commander, his assistant division commander, the chief of staff, G-2, and G-3 put their heads together and formulated a tentative plan of action for the crossing based only on map and aerial photograph study. Essentially, this plan called for the use of the 7th and the 30th Infantries for assault since they were out of the line and available for special training. The 15th Infantry would hold the river line, and would assemble in division reserve after the crossing had been effected. The formation for the assault was tentatively decided on as regiments abreast, 7th Infantry on the right. A tentative regimental boundary was set up for the near bank to delineate reconnaissance areas for the assault regiments.

At this point the artillery commander and the division engineer were called in,



acquainted with the plan, and directed to commence study and preparation in close cooperation with G-3 and the regimental commanders. G-3 was instructed to issue a training directive covering joint river crossing training by infantry and engineers.

When this get-together wound up, the chief of staff oriented the remainder of the general and special staff and instructed them to turn on the steam in their respective departments.

The G-3 and the Engineer Officer conferred that afternoon and arrived at an understanding of the capabilities of the Division Engineers as well as to what could be expected from the supporting VI Corps Engineers, the 1st Battalion, 36th Engineer Combat Regiment. The corps plan called for four heavy (Class 35-40) bridges to be constructed on the 3d Infantry Division front by the 1st Battalion, 36th Engineer Combat Regiment. In addition, this battalion could construct one infantry assault bridge, Class 6, capable of passing up to ¾-ton vehicles. It was planned that the organic division battalion, the 10th Engineer Combat Battalion, would handle the assault boats and the construction of foot bridges.

By 0300 the following morning, 12 November, G-3 had prepared in draft form for publication, three outline plans for the crossing to be issued to subordinate commanders that afternoon. These were issued on schedule—the operation was underway.

By evening of 14 November, the Commanding General, the staff, the regimental commanders, infantry battalion commanders, the artillery commander, and the engineer had conducted reconnaissance of the river line, and unanimously recommended that the crossing be made in the area about 2,000 yards north of the river bank village of St. Michel. This area offered two suitable bridge sites alongside a destroyed bridge. Two other suitable bridge sites were located at Clairefontaine, 4,000 yards farther north. However, the latter area was not suitable for assault crossing. The following features contributed to the selection of the St. Michel area for the crossing:

1. The enemy in the area was not defending the far bank of the river. Instead, he was intrenched along a main highway paralleling the river some 1,000 yards east thereof. This information was gained from the 15th Infantry which had been maintaining careful watch of the enemy by a network of observation posts and patrols. The defenses were more complete than had been anticipated, consisting in the main of extensive trenches, emplacements, and wire. It developed that the enemy intended to use the line of the Meurthe as the outpost for a well prepared winter line which had been constructed on higher ground to the east, principally in the Saales area (Sketch 2).

2. The road net leading to the crossing area on the near bank was favorable for concentration.

3. Ample woods affording concealment boarded the near bank.

4. Rolling hills on the near bank offered observation and direct fire positions.

5. The river banks were favorable on both sides.

6. The river averaged only 125 feet in width for about 1,200 yards in the area, as compared to widths upwards of 300 feet in the adjacent areas.

Upon learning that the enemy was not manning, nor even paying too much attention to the far bank, the Division Commander decided on a startling method for effecting the crossing. At first his ideas were viewed with some misgiving, but after they had been digested, his plan appeared so sound, simple, and workable, that it was wholeheartedly indorsed by all concerned. It went like this:

1. Instead of employing assault boats for crossing, the river was to be spanned by prefabricated footbridges installed during darkness after a platoon of infantry had gone over in boats to form a small bridgehead.

2. Two 150-foot footbridges were to be constructed in the zone of each assault regiment.

3. Assault regiments were to cross at least two battalions each during darkness to an undetermined line of departure 500 or 600 yards east of the river.

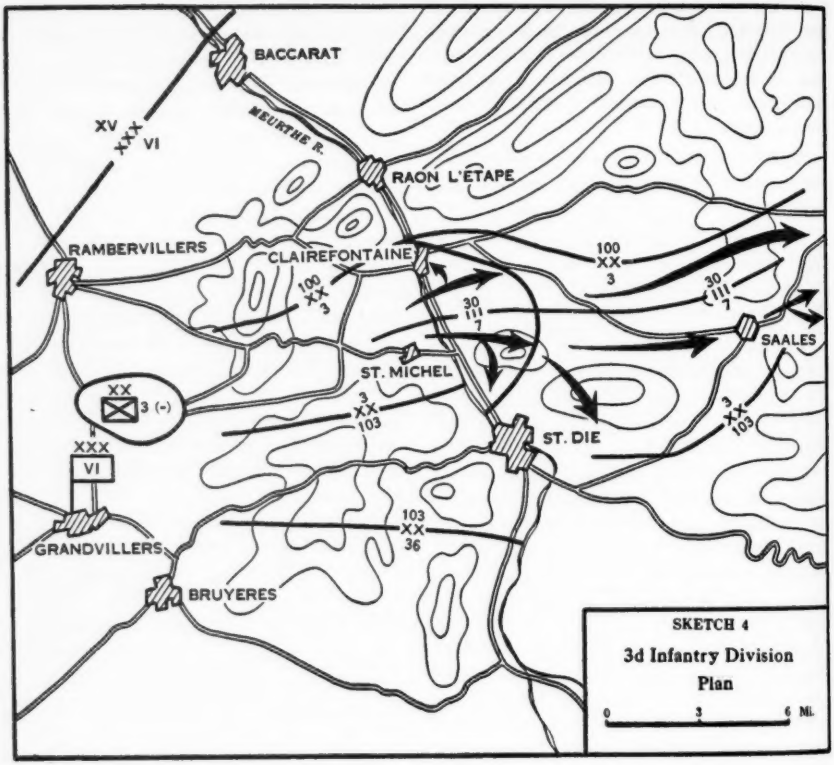
4. The attack from this line of departure on the far bank was to jump off at daylight, 0645, following an intense preparation by all weapons available to the division.

This plan of operation (Sketch 4) obviated the dangers of an assault crossing by boats so long as the leading troops went undetected. However, it was almost entirely predicated on the precision performance of both engineers and infantry. Since the critical activity was to occur at night, the training of the assault regiments was modified immediately to feature night exercises with the engineers. These exercises were to emphasize the construction of prefabricated footbridges and the crossing of infantry and infantry weapons over them.

The preparatory artillery fire was planned to start thirty minutes before daylight. Accordingly, the artillery was directed to conduct short pre-dawn and after-darkness periods of firing to accustom the enemy to our firing at these times. It developed later from prisoners of war that this trick worked to a "T." Let us examine the situation more closely and see what else has been going on in the way of preparation for this crossing.

G-3 meanwhile, revised the initial outline plans and issued a new one in field order form so that when the time came the Commanding General's orders for execution could state simply: "Execute Plan POWERHOUSE" (the code name given the division plan). G-2 produced a large number of defense overprints and overlays, terrain analyses, aerial photographs, and written estimates. He also issued necessary maps with the assistance of the Engineer. The Engineer prepared and issued an annex listing the river data, the engineer equipment, engineer organization for the crossing, and a road capability diagram. G-4, with the Artillery S-4, obtained everything he could from the ASPs in the way of extra ammunition for the big show. He also wheedled corps for some reinforcing transportation. The Signal Officer perfected an elaborate wire plan that included special means for spanning the river with spiral-four cable. Except for the 15th Infantry, which had been using its radios ever since it began its mission to gain control of the west bank of the river, radio silence was being enforced for the entire division. The Provost Marshal established a light line some 10,000 yards from the river. He also prohibited daylight movement of vehicles in the sector of the 15th Infantry, except for single reconnaissance jeeps, because much of the terrain in the area of the regiment was under enemy observation. In addition, he teamed up with the movements officer in setting up a system of traffic control posts for the operation.

G-3 also conferred with the movements officer (a member of his section in the 3d Infantry Division) and explained to him the Commanding General's desire for crossing priorities for transportation, armor, and artillery. The two of them working together set up several priority plans based on the assumption that varying numbers of bridges would be available. They also formulated a schedule of movements necessary to effect the concentration



during the three nights prior to the crossing.

Concurrently with the arrangements for the movement to offset the concentration, there had been the digging-in of gun positions, emplacements, command posts, observation posts, and other forward installations. Mine sweeping and camouflaging likewise had been completed. Since so many tasks of this nature had presented themselves, G-3 prepared and issued a task schedule in order to portray for the entire command the complete picture of the things to be done and the deadlines to be met. The schedule, in part, based on a crossing date of 20 November, is shown on page 31.

The road net leading to the river on the friendly side permitted concentration forward on two separate routes. Accordingly, one route was given to each assault regimental combat team. Regimental combat teams were permitted to infiltrate weapons and other equipment at night. Likewise, division and supporting corps artillery were permitted to change position areas by infiltration. Bridging material was moved into special assembly areas about four miles west of the river,

adjacent to, but not in the same areas given to tactical transportation and armor.

In order to insure minimum delay between the time that foot troops moved from the bivouac area until H-hour, detailed plans were made to move foot troops forward on the night of the crossing to detrucking points approximately three miles west of the river. Upon detrucking, the foot troops were to move directly to assembly areas behind the footbridges and cross over to the line of departure on the far bank. The motor movements were scheduled so that the foot elements would arrive at the assembly areas at the estimated time of completion of the footbridges.

Minimum essential tactical transportation plus tanks, tank destroyers, and reconnaissance troop vehicles were moved forward to the concealed staging area after the transportation hauling the assault infantry was on the move. None of these vehicles could move beyond the staging areas to the bridges until called forward through the traffic control wire system from the control posts located at the bridges. These posts were under control of a division staff officer. If an assault regimental commander desired any change in the priority schedule set up for the crossing, he could communicate with one of the bridge control posts and arrange with the officer in charge for the desired changes. The officer in charge was responsible in particular for the careful control of transportation moving to the rear from the far bank. In general, his instructions in this regard permitted only evacuation vehicles to come back across his bridge.

TASKS	14 November	15 November	16 November	17 November	180600 Nov	190600 Nov	192400 Nov	200200 Nov
Battalion Training	x	x	x	x				
Weapons Emplacements Completed					x			
Registration Single Pieces Completed					x			
All Tactical Rcn Completed						x		
Mine Sweeping Completed						x		
CPs, OPs, Adv Sig Installations, Aid Stations Completed						x		
Arty and other Weapons Occupy Positions						x		
Smoke Generators Emplaced						x		
Bridgehead Platoons and Footbridges Close Fwd Area						x		
Remainder Div and Corps Engr Equip Close Fwd Area						x		
Infantry Close in Fwd Assembly Areas							x	
Tactical Transport and Armor Close in Staging Area								x

Portable smoke generators from an attached smoke generator company were to be dug-in the night before the crossing to screen the crossing areas and the bridge sites. The generators were to be located in accordance with the direction of the wind on that night. Chemical mortars were likewise available in forward positions for smoke missions.

Situation Normal

So much for the preparations up to this point. Now prepare yourself for one

of those wartime "bearcats" that cause the strongest men to weep. On 18 November, or two days before the crossing was to be effected, corps notified the 3d Division that the splendid program of the 100th Infantry Division in its attack southeast from Baccarat on the other side of the Meurthe indicated the advisability of canceling the crossing plans for the 3d Infantry division and of passing the 3d Division through the 100th into the same zone it was given under the crossing plan.

Immediately upon receipt of these instructions the concentration plan for the crossing was called off, and the assault regiments were directed to reconnoiter attack positions behind the front lines of the 100th Infantry Division in the vicinity of Raon L'Etape. A movement order was issued covering the concentration. Movement would be initiated on corps order on the night of 19-20 November. It is to be noted here that this latest plan initially left the 15th Infantry holding the river line in its sector. However, as soon as the advance through the 100th Infantry Division on the far side of the river cleared the bank opposite the 15th Infantry, a bridge was to be constructed to permit its crossing on a non-tactical basis.

On the morning of 19 November, with everyone geared up for the move to the attack positions, word was received from corps that the progress of the 100th Infantry Division for the preceding twenty-four hour period had been considerably retarded, and that instead of passing the 3d Infantry Division through the 100th in the face of increasing resistance, the 3d would undertake its crossing of the Meurthe as originally planned on the 20th.

After some delay incurred in bringing back advance details already established in the forward area of the 100th Infantry Division, and in getting out the new instructions, the concentration plan was started again. It was impossible, however, to emplace all direct fire weapons or any of the smoke generators. Nevertheless, the previous planning permitted the job to be completed in an effective fashion.

It so happened that, commencing on 16 November, light showers gave way to a series of heavy rains which caused a one to two foot rise in the river, thus flooding adjacent fields on either flank of the crossing area to distances upwards of 300 yards. The river current stepped up markedly.

The Crossing

On the evening of 18 November, the 15th Infantry succeeded in crossing an infantry platoon by boat to the far bank, in the zone of advance of the 7th Infantry. The platoon occupied a house immediately in front of the enemy's main position without being detected. It reported its situation by SCR-300 radio during the night, and was ordered to hold its position and to observe during the following day. It sent in several reports during daylight of 19 November, indicating that the enemy was holding his positions with light forces, all of which appeared to be occupying buildings along the Baccarat—Raon L'Etape—St. Die highway.

On the evening of 19 November, the platoon was ordered to patrol back to the river bank at the crossing area and to contact and to orient the footbridge assault platoons when they arrived on the far bank. This operation was attended to with complete success and was instrumental in assisting the assault platoons in the accomplishment of their missions.

The prefabricated footbridges together with the engineer work parties and the infantry bridgehead platoons closed into forward positions in the woods adjoining the river on the night of 18-19 November.

When the original crossing plan was again placed in effect on the morning of 19 November, the Division Commander decided to devote his last-minute attention

to ways and means of taking advantage of rapid gains on the far bank. The reports of the 15th Infantry Platoon from the enemy's front yard led him to believe that rapid gains initially would be possible. He had previously mentioned the possibility of organizing a mobile task force which could break away if the opportunity presented itself, but this idea had not been developed. On this particular morning, however, he directed G-3 to form a task force composed of an infantry battalion from the 15th Infantry, the division reconnaissance troop augmented by the division's sixty-man volunteer "Battle Patrol," a tank company less a platoon, a tank destroyer platoon, a battery of armored field artillery, and a platoon of engineers with a bulldozer. He also directed that twenty-five 2½-ton trucks be assembled from organic and reinforcing transportation to motorize the infantry battalion.

By 1500 of that day the task force had been organized and commanders of each component had been briefed at the division advance command post, now established in a village about two miles west of the river. Orders to the task force commander included an assembly area on the far bank where the force was to unite on division order prepared for action. Several possible plans of action were given the commander for study.

By nightfall of 19 November, everything had been accomplished except the forward movement of the assault troops, tactical transportation, and of such armored units as were not already forward in direct fire positions or in artillery position areas for participation in the preparation. A steady flow of reports into the war room of the advance command post indicated that these movements were proceeding according to schedule. Traffic control posts checked in regularly to report the passing of the various columns.

The Assistant Division Commander, who had been placed in charge of the crossing area with a command post at the footbridge sites, reported shortly after dark that the bridgehead platoons had just crossed the river without incident, and that they were in contact with the 15th Infantry Platoon. At 2359 he reported that all four footbridges were in, and that the infantry, which had closed in the assembly areas by 2300 was ready to cross. He commented that the rising water might create a problem of maintaining the bridges, especially the approaches.

While the rear areas were experiencing considerable difficulties, the crossing of the assault regiments was progressing smoothly. By 0600, five battalions had crossed, with the four leading or assault battalions poised for the jump-off from positions about 300 yards west of the Baccarat--Raon l'Etape—St. Die highway. The reserve battalion of the 7th Infantry on the right was held in a concealed assembly area on the near bank prepared to cross on order.

At 0615, the preparation commenced, and continued with great intensity until 0645, when the leading infantry echelons drove ahead to their initial objectives against moderate opposition consisting mainly of small arms, machine gun, and mortar fire. One hundred fifty casualties were sustained from thick mine fields guarding the enemy positions.

During the day of 20 November the attack moved ahead rapidly past the initial bridgehead line. The foot elements of the 15th Infantry were assembled and moved to a division reserve area on the far bank.

By now it was certain that from the standpoint of the foot troops the attack was a complete success. But what about tactical transportation, supporting artillery, armor, supply and evacuation vehicles? When would bridge availability permit these to cross over and join the fight? Herein lies another example of the

turmoil and reverses that beset the best laid plans.

During the period in which the footbridges were being installed on the night of 19-20 November, the 1st Battalion, 36th Engineer Combat Regiment installed an infantry assault bridge which was completed by jump-off time. This bridge passed seventy-five ¼-ton weapons carriers, command, and communication vehicles by 2300 the night of 20 November, at which time it was made impassable by the rising water and mud. With the advance pushing to the limit of the range of the supporting artillery, the foot soldiers were desperately in need of bridges for the displacement of supporting arms.

But to backtrack a little, the 1st Battalion, 36th Engineer Combat Regiment, together with certain personnel from the 10th Engineer Combat Battalion, had initiated final reconnaissance of the four heavy bridge sites at daylight, 20 November. Reconnaissance of the two Clairefontaine sites was rendered impossible by small arms, mortar, and self-propelled gun fire from the vicinity of Clairefontaine. At the St. Michel sites, however, reconnaissance proceeded satisfactorily, and by midmorning material for an M2 Treadway bridge had been moved to the bank.

Shortly after construction got underway, it was suspended due to accurate fire from enemy self-propelled guns. Although immediate efforts were made to smoke the sites by means of smoke generators, smoke pots, and chemical mortars, shifting winds and the fact that the enemy had registered on the site minimized the effect of the smoke.

By late afternoon of 20 November, the advance had progressed to such an extent that the enemy guns firing on both the Clairefontaine and St. Michel sites had been destroyed or forced to displace out of range. At darkness, therefore, work progressed in earnest with the result that by 0645, 21 November, the M2 Treadway bridge at the St. Michel site was completed. The bridge promptly allowed the passage of seventeen tanks and tank destroyers together with twenty other tactical vehicles. At this point one tank bogged down at the exit of the bridge due to high water, and the bridge was now inoperative.

By 1000, however, the Bailey bridge at the St. Michel site was completed, and all transportation due to pass over it, plus a number of vehicles originally scheduled to cross on the Clairefontaine bridges were sent across. By 1330, the Bailey bridge at Clairefontaine was completed for light traffic, and by 1630 it had been reinforced to accommodate Class 40 loads. The remaining heavy bridge, constructed just south of the main Clairefontaine bridge, was completed during the night of 21-22 November, but provided only for the passage of miscellaneous supply traffic loads up to and including 2½-ton trucks. Effective at 2400, 21 November, the main bridge at Clairefontaine became the division bridge, and it alone was used thereafter.

Before concluding, it should be explained that the 103d Infantry Division, which up to 19 November had been in the sector on the right (south) of the 3d Infantry Division, was ordered to assemble two RCTs prepared to cross the Muerthe behind the 3d Infantry Division. These were to cross on the 3d Division footbridges during the night of 20-21 November, pass through the right of the initial bridgehead, and continue the advance to the southeast with St. Die as the initial objective. This passage was preceded by complete reconnaissance on the part of the 103d Infantry Division during daylight of the 20th, and was completed without incident during the night as planned. The 103d Infantry Division attack was launched through the right of the 7th Infantry at 0900 on 21 November, assisted by a preparation fired

by the 3d Infantry Division Artillery. At 1430 on that afternoon the St. Michel Baily bridge was turned over to the 103d Infantry Division.

So ends a narrative of a small part of the November 1944 battle picture. The conclusion is evident—"They don't ask you how you got there, just how many."

The prime purpose of the armed forces is to win without excessive loss of life. In that purpose the Army won a success without precedent in our history, and this is proof enough of the character of the military leadership. It could not have succeeded if there had been anything radically wrong with our leadership, and I mean the leadership supplied by those in uniform.

Secretary of War Robert P. Patterson

It is impossible for the Nation to compensate for the services of a fighting man. There is no pay scale that is high enough to buy the services of a single soldier during even a few minutes of the agony of combat, the physical miseries of the campaign, or of the extreme personal inconvenience of leaving his home to go out to the most unpleasant and dangerous spots on earth to serve his Nation. But so that our troops might know that the Nation realizes this simple truth, the Army made it a determined policy to decorate men promptly for arduous service and for acts of gallantry while they were fighting.

General of the Army George C. Marshall

Why

The Airborne Division?

Lieutenant Colonel John H. Swenson, *Cavalry*
Instructor, Command and Staff College

THE Airborne Division as originally conceived was to be a light unit of combined arms, completely air transportable and arbitrarily limited to a strength of 8,000 men. It was built around the C-47 airplane and the CG-4A glider. It was born of a necessity—the execution of a vertical envelopment of the Nazi seacoast defenses. Its primary reason for being was to assist the seaborne units to gain a foothold on the continent of Europe. Other uses to which it might be put were to be purely incidental to this principal design.

Two points of the original concept were soon found to be impractical. With the equipment then available, a completely air transportable unit could not sustain itself even in garrison. This led to the addition of non-air transportable equipment with the result that a ground or rear echelon became an accepted complement of the airborne division. It was soon determined that an organizational strength of 8,000 was inadequate to sustain the division under expected conditions of combat. A series of modifications therefore ensued. The airborne division as we know it now is only about 2,000 men lighter than the infantry division in numerical strength.

Still other modifications are to be expected. For instance, a recent personnel policy requires that all members of an airborne division be parachutists, as well as glidermen. This will probably lead to the abolition of parachute and glider units as such. If this change is finally approved, personnel will be delivered mainly by parachute whereas heavy equipment will be delivered by glider. Such a change, because it would place heavier equipment in what are now parachute units, would further strengthen the airborne division.

The trend in organization has always been toward a parity with the infantry division. The announced desire of senior airborne officers has been to make the airborne division as nearly like the infantry division as could be permitted by the available air transportation and the conditions encountered in airborne assault operations. However, the airborne division has not completely recovered from the early concept under which it was born. It still has no combat equipment except that which can be carried in the C-47 airplane or the CG-4A glider. Expressed in another way, it is lighter than the infantry division not only in personnel, but in the caliber of artillery weapons and to some extent in the numbers of supporting infantry weapons.

In a sense, the airborne division has not kept abreast of the development in transport aviation. With the C-82 airplane and the CG-10A glider, it is possible to transport by air any piece of combat equipment now in the infantry di-

vision except for the tanks of the cannon and antitank companies. Airplanes and gliders now on the drawing board may soon make practicable the transportation even of these tanks. This, then, would make possible the organization of an airborne division whose combat elements would be equivalent to those of the infantry division. The question then arises: why retain the airborne division in our armed forces? This question was studied by the General Board, United States Forces, European Theater. Their report on the issue reads as follows:

"In considering the further development of our army with respect to airborne operations, it is desirable to review possible alternatives to the airborne division. In order to make provision for airborne combat, three organizational solutions present themselves on the division level:

"*a.* A standard, air-transported infantry division; or

"*b.* A standard, air-transported infantry division, reinforced by one or more small parachute units; or

"*c.* An integrated airborne division, specially trained, equipped, and staffed for airborne operations.

"To state this (the first) alternative is in itself almost enough to reject it. Suitable fields are required for the landing of the air transports necessary to carry an infantry division. The enemy presumably will defend, actively and passively, such fields. If disaster is not to be invited, it will be necessary to employ parachute forces to overcome the enemy

CG-10, First Troop Carrier Command's newest and most capacious glider. (U.S. AAF photo.)

defenses, as well as to seize, secure, and possibly prepare the landing areas before air transports can be successfully landed. However, it is not likely that an adequate number of parachutists could be recruited and trained within the standard division. The inherent reluctance of most men to jump from an airplane precludes the effective use of any but volunteers as parachute troops. Moreover, the relatively few volunteers must be screened for the required combination of physical and mental stamina, as well as hardened by long, highly specialized, training. Problems of equipment further emphasize the impracticability of integrating parachutists into a standard division. To be sure, in exceptional circumstances, as when the enemy is known to be defenseless or in a state of disintegration, it is conceivable that a standard division might be moved into hostile territory without the support of parachutists. For such a contingency, and also for the purpose of air movement in a non-combat zone, it is desirable to train standard infantry divisions in air transport techniques. But a standard division, unsupported by parachutists, cannot be considered capable of performing an airborne combat mission.

"A more reasonable possibility is that a standard, air-transported infantry division, reinforced by specially trained and equipped parachutists, could be an effective substitute for an airborne division. Such an alternative, if feasible, would have several advantages. By obviating the training and equipment peculiar to the airborne division, it would tend to simplify the structure of our army on the division level. Eliminating one type of special-purpose division, it would make for more efficient employment of manpower. Detailed consideration of the problem, however, indicates that this proposal does not offer a real alternative to the airborne division. The reason is simply, that to be effective, the reinforcement of a standard division in an airborne operation must consist of a comparatively large number of specialized troops of the combined arms. The seizure and retention of an airhead requires a force sufficient in troops to hold a relatively large area, strong enough in weapons of the several arms to overcome heavy opposition, adequately trained so that its elements constitute a team, properly staffed to care for the multitudinous details of planning the operation, and capable of sustaining itself independently for a limited period of time. In short, the necessary reinforcement must itself be an airborne division. It is desirable to review the considerations that lead to this conclusion.

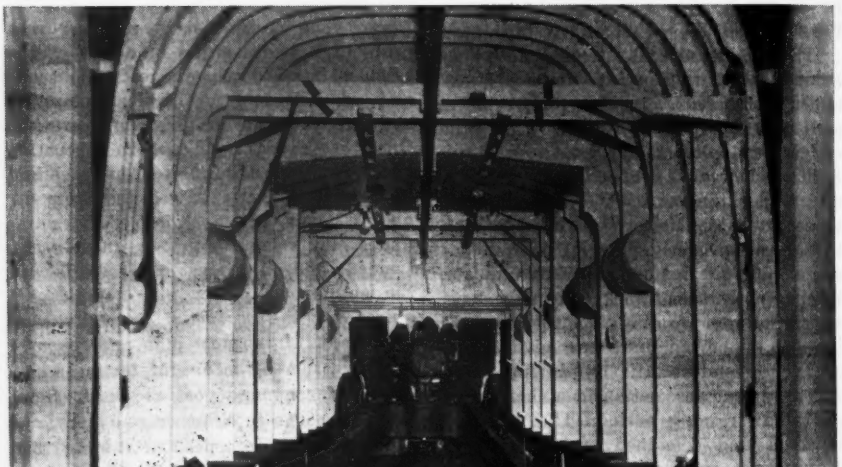
"The seizure and holding of an airhead requires a force much larger than a parachute regiment, even if it be reinforced. An airfield sufficiently large to land modern transport planes—or the larger gliders—is at least a mile long. This area must be protected from the direct fire of small arms and, so far as practical, from artillery fire. To accomplish this, hostile infantry and artillery must be destroyed or driven beyond the range of the landing zone. At the very least, ground observation must be denied the enemy. Even assuming that our air force has complete superiority, the dropped parachute unit must control a minimum perimeter of eighteen miles, far too large an area to be covered by the personnel of a regiment. Furthermore, a parachute unit of regimental size, unless heavily reinforced, would not have sufficient weapons with which to secure the area described above. The necessary reinforcement would increase the size of the original unit to about that of a division. However, even with personnel and weapons identical to those of a division, the reinforced parachute unit would not have the effective fire power of a division. Such a degree of effectiveness comes only after long combined training, only after each com-

ponent has become familiar with all others with which it operates.

"The opportunity for team training is lacking when reinforcing units are attached to an organization only for a particular operation. This is especially evident as applied to airborne operations. Each element of a dropped force must be able, under the most adverse conditions, to assemble at its designated point so that it can properly play its part in accomplishing the team task. This requires the instinctive teamwork that only long association and training with the supporting and supported units can give. Such proficiency and familiarity do not come with transient association in a short, concentrated, training period. The requisite technical and combined training, moreover, cannot be adequately conducted by the commander of a small parachute unit. Such training lies within the province of a division.

"Ability to sustain itself for a limited period is an essential quality in an airborne organization. Such ability does not exist in a unit smaller than a division. This is not a matter of numbers of fighting men or weapons, for these can be obtained by reinforcement. It is, rather, the ability of a unit to supply itself from the airhead for a limited period with an adequate store of ammunition, signal supplies, fuel, and food. It also must maintain in operating condition sufficient weapons, signal equipment, and, if they have been landed, vehicles. This requires a relatively large and highly skilled supply element, together with special troops such as are contained in the division. Makeshift improvisation, to which a small reinforced parachute organization would be limited, would not satisfactorily solve the supply and maintenance problems that each operation entails.

"An airborne operation demands a large, specially trained, and versatile staff if the necessary coordination of air, ground, and possibly naval, forces is to be achieved. Again, long association in training is a prerequisite. The citing of a few of the essential staff duties suggests the scope and specialized nature of the planning and execution of an airborne operation. Once the target for an airborne operation has been selected, suitable drop zones and landing zones must be selected from air photos, maps, and terrain reliefs; pathfinder units must be organized and trained; and units must be provided with the special equipment and supplies required for the *particular* operation contemplated. Units must plan and rehearse the operation by means of tactical exercises and command post exercises. Similarly, airborne intelligence and personnel problems require special training and skill on the part of the staff. The procurement and maintenance of parachutes and other airborne equipment, as well as the provision of supplies by air, present unique supply problems. The logistics of moving troops to marshalling areas, of assignment to aircraft, and of transporting the troops to the target must be solved. Expert advice and assistance on other matters peculiar to an airborne operation—communications with air support and troop carrier units, medical care, engineer demolitions and construction of obstacles—are also required by the airborne unit commander. Moreover, coordination must be effected with friendly forces, ground, air, and naval, in the corridor of approach and in areas adjacent to the target. In this respect, the rank of division commander is a marked advantage in the necessary coordination of plans with high headquarters. Finally, the plans must be executed with great skill and energy. The limited staff of a small parachute unit is simply not adequate for such a task. Nor can the commander or the staff of the standard infantry division be expected to have the specialized



Interior of C-82's large cargohold. (U.S. AAF photo.)

knowledge, training, and experience necessary to meet these requirements."

The Board concludes: "It is therefore apparent that no alternative to the airborne division is acceptable. Other organizations lack the necessary combination of trained personnel and teamwork, the fire-power, the supply and maintenance facilities, and the command and staff available in the airborne division. If our army is to carry out its mission in the future, the airborne division must be retained."

The report just quoted can stand on its own merits. There are, however, additional considerations which the board did not include in the foregoing discussion.

Even if it were possible to transport all the equipment of an infantry division by air, the table of organization for an infantry division would not suit the purposes of the special operations in which an airborne division engages. For example, certain additions would be necessary. Among these additions the division staff would require augmentation. It will always be necessary to have the air advisers and the air-ground liaison officers now in the airborne division. The intelligence section also must be enlarged by adding specialists such as aerial photograph interpreters. Because of the prevailing isolation and tenuous routes of evacuation, it would be desirable to have

surgical teams organic to the medical unit of an airborne division. The special requirements for maintenance of parachute equipment make a parachute maintenance company a necessity. Moreover, unless and until technical developments do away with the necessity for pathfinder units, the airborne division must have a pathfinder company. While these are only some of the more obviously necessary additions, they alone necessitate a separate table of organization for the airborne division.

As explained, when our first American airborne divisions were conceived, the reason for their existence was clear. They were needed to assist amphibious forces to gain a foothold on a fortified coast line. What need have we for them now or in the future?

In peace or in war, the airborne division, with any reasonable table of organization and equipment, is easy to justify. The ability of such a unit to utilize aerial transportation without regard to the existence of airports at its destination suggests its use, during peace time, in connection with internal crises such as earthquakes, floods, and other civil emergencies. This in itself is a compelling argument for the maintenance of the airborne division.

When we speak of a future war, we think of a sudden all-out onset by an aggressor who employs long-range robot weapons of great destructive power. Anything we do in the way of passive and perimeter defenses against such an attack is a step in the right direction. However, passive measures and perimeter guards cannot constitute our complete defense. We must be prepared, at the first indication of an actual threat, to strip the enemy of his means of attack. Such a concept of defense encompasses the destruction of the plants wherein the enemy manufactures his implements of war.

Such plants, by subterranean construction of other means, will be made to withstand air or robot attack. The only way to render them ineffective will be actually to penetrate their vital depths with the bayonet. Furthermore, an enemy would certainly use great care in the selection of his manufacturing sites. In all probability, he would locate them well inland where he could take maximum advantage of existing terrain barriers.

In the destruction of such installations, time will be of the utmost importance. If the enemy can delay us, even for a short time, he might well nigh destroy us as a nation. Therefore, surface movement against these vital objectives would be of little avail.

Movement by air appears to be the only way in which we could hope to get the bayonet there on time.

This does not mean that all our force need be airborne. It does mean that we must have, at all times, airborne divisions ready and capable of seizing and securing airheads into which we can air land other ground forces.

DD Tanks

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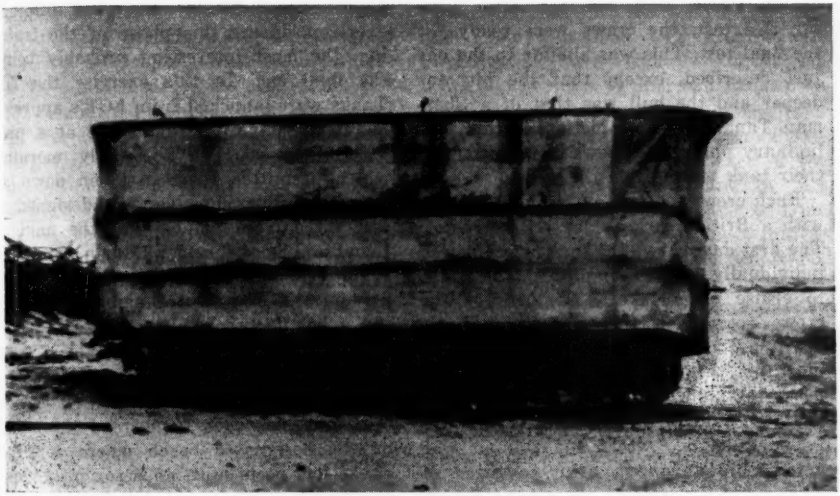
This article is based on the personal experience of the author who commanded the 743d Tank Battalion until after the landings in Normandy. —THE EDITOR.

ARCHIMEDES, were he alive today would surely be surprised at some of the bizarre uses to which his principle has been applied, one of the most fantastic applications being that of the DD Tanks. In this case a tank is floated by placing a canvas screen around it. Any size or weight of tank can be floated by this method, the heavier the tank the higher the canvas screen; simple, and it works. Place an empty wastebasket in water and it will float. Now place a weight in the bottom of the basket and it still floats but the freeboard is reduced. When the weight has been increased to the point where there is no freeboard remaining, the wastebasket will sink. If, however, the sides of the wastebasket could be extended indefinitely the weight could also be indefinitely increased and the wastebasket would remain afloat. So it is with the DD Tanks. The tank gives the weight and the canvas screen supplies the freeboard.

This idea for floating tanks was conceived by a British designer, who for three years prior to the Normandy landings worked on his idea. The thought was crystalized in what is now known as the DD Tank, the DD standing for Duplex Drive, as the tanks are driven by two propellers when in the water. The first models produced were British Valentine Tanks. They performed successfully in their trial runs and on training tests, so it was decided to manufacture Sherman DD Tanks and use them for the initial assault waves in the Normandy invasion.

The DD Tank, when afloat, looks very much like a canvas duck boat. The canvas screen which floats the tank is the only part visible above the surface of the water. With this deceptive appearance they would be indeed a surprise to an enemy unaware of their identity. Since this canvas screen is held up by means of compressed air and collapsible struts, a turn of a lever will permit the screen to be collapsed and the tank then is able to assume its normal role as a standard land tank. Thus with their deceptive appearance and their ability to assume the role of the standard land tanks, immediately after landing, it was realized that if their existence could be kept secret, the Germans would be surprised when confronted with blazing tanks instead of innocent canvas boats.

Three American separate tank battalions were selected to lead the assault waves of the First U.S. Army on Omaha and Utah Beaches of the Normandy Coast. These tank battalions were the 70th, 741st and the 743d. Each battalion would land two medium tank companies, equipped with DD Tanks at "H" hour on D-day. In order to prepare these battalions for



DD Tank on land.

their jobs, extensive training was needed in the handling and functioning of the DD Tanks. As these battalions were located in England and the British had the facilities for such training, a six weeks schedule was established. At the end of the six weeks period the DD Sherman Tanks were scheduled to arrive in England and the American units would then train using these tanks.

The first two weeks were routine training periods, but the last four weeks contained many unusual features. The fresh water instruction required each tank crew to become familiar with the use of the Davis Lung, which is the escape apparatus developed for use by submarine crews when they have to abandon a submerged submarine.

The first period of this course was a conference on how to use the Davis Lung. The next step was practical work which required each man to walk through a pit twelve feet deep filled with water, using one of these lungs. This was to develop confidence in the apparatus. Next, each man was given instruction in how to rise from the bottom of the tank and float on the surface, using the lung. When proficiency in these exercises was attained the men were ready for their next-to-final step on this phase of training. They were issued a much simpler lung which operated on the same principle as the Davis Lung but was good only for seven minutes under water, whereas the Davis Lung was good for about thirty minutes. The new lung was much lighter and less bulky, and was standard equipment in the DD Tanks.

After learning how to breath on dry land with the simpler lung, each crew descended to the bottom of a pit twelve feet deep where the hull of a Valentine Tank had been placed. Each crew member took his assigned place in the hull and waited. At a signal from the instructor a valve was opened and in thirty seconds the pit was filled with water. When the water was turned on the men donned their escape apparatus but remained in position under water until the signal to surface was given. The period under water was

usually two or three minutes. After passing this test, the crews were ready for the final test. This was similar to the one just described, except that the pit was deeper and the hull was that of a Sherman Tank. Upon completion of this preliminary phase, the crews were ready for their tank training on the water.

Each crew was assigned to a DD Tank with a British sergeant as an instructor. The first day or two the tanks were moved individually from the land into the water to cruise on a lake. Members of the crews rotated in the various positions. When proficiency was reached in launching from the land, the tank crews then practiced launching from a ramp which had been built to simulate one on an LCT.

The final two weeks of training was much more advanced, as it consisted of learning to navigate on the ocean, launching from an LCT and firing live ammunition when the DD Tanks reached their landing beach. There were many different exercises during this phase of the training, the most interesting probably being the final one. In this exercise the DD Tanks were launched from LCT's approximately 4000 yards from shore at a predetermined hour in the early morning which permitted them to touch down at first light. The maneuver was designed to test three main points—(1) the navigational ability of the crews during blackout conditions, (2) proficiency in formation driving and, (3) the technique of assaulting a hostile beach.

The first American unit to take part in this exercise launched successfully, touched down on time and opened fire. They soon ceased fire, however, for instead of landing on the designated beach where a firing range had been built, an error in navigation had been made and they had attacked the Isle of Wight. Fortunately, no one was hurt and no serious damage was done.

DD Tank being launched.

After completing the six weeks of training with the British, the American units moved to a DD Tank training center recently established on the southern coast of England. All exercises from then until the Normandy invasion were conducted using DD Sherman Tanks. Many times during this period the men had to use the escape apparatus and the prior practice in the use of this device paid dividends in lives saved. In all rehearsals for the Normandy invasion, the DD Tank units led the assault. These rehearsals and the training period on the DD Sherman Tanks proved conclusively that a calm sea was essential to the success of the tank mission. Even a fairly rough sea in which the waves were forming whitecaps would collapse the canvas screen and down would go the tank.

History records that on 6 June 1944 the sea was anything but calm. In fact it was rougher than at any previous times the DD Tanks had been launched. Nevertheless the American DD Tank units played an important role in the landing on the morning of D-day. On Utah Beach the 70th Tank Battalion launched in a bay where the sea was moderately rough. Of the thirty-four tanks launched all except six reached shore. Of these six, five were accounted for when their landing craft was sunk by hitting a mine and the sixth was sunk when its screen collapsed from the blasts of a nearby rocket ship. On Omaha Beach the 743d Tank Battalion did not launch their tanks due to rough water. The Navy landed them on the beach where the tanks waded ashore. No tanks were lost prior to the landing. The 741st Tank Battalion launched their tanks at H-50, having decided that the advantages to be gained justified the risks of sinking in the rough sea. Five of their tanks reached Omaha Beach. Twenty-nine were sunk by the rough sea.

Official reports indicate that as far as can be determined, the secret of the DD Tanks was kept until the landing on D-day and many Germans were greatly surprised when the innocent looking canvas boats turned out to be Sherman Tanks.

The courage and training of the tank men of the 70th, 741st and 743d Tank Battalions played an important part in the success of the Normandy landing. In spite of rough seas, enemy resistance from heavily fortified positions, and having to pass through mines and underwater obstacles, these men were able to land sixty-six percent of their tanks, and to provide the tank support for the 1st and 4th Infantry Divisions in their historic assault.

DD Tanks were also used to good advantage in the amphibious assault on the south coast of France on 15 August 1944, when thirty-six were employed by units of the VI Corps. Of these, twenty were water launched at varying distances from shore. The remaining sixteen were landed by the Navy directly onto the beaches. Eighteen of the water launched tanks reached shore successfully. The remaining two were sunk, one by an underwater mine and the other by the wake from a passing vessel.

During March 1945 the DD Tanks were again employed. This time they were used to cross the Rhine River. They met with varying degrees of success. Those that crossed with the 30th Infantry Division, did so against light opposition and were able to continue in support of the infantry immediately thereafter. Those supporting the 89th and 65th Infantry Divisions were not so successful.

The future of the DD Tank is doubtful. There is, however, a need for a standard land tank which can fire while afloat and then assume its normal role on landing. The design of the DD Tank is a partial answer to this problem. Further research and development directed with this idea in mind should be successful in producing an efficient tank, capable of performing its mission both on land and sea.

Counseling *for the Soldier*

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COUNSELING, as we shall develop it, is the art of using the interviewing contact to assist the individual soldier to adjust himself to his surroundings and to his work

"Not by bread alone does man live . . ." after much research, modern industry has made an interesting finding: Material security in the form of adequate wages and moderate hours of labor, while important, does not play as vital a part in a worker's productivity as does freedom from pressing personal problems and emotional conflicts. From the knowledge gained in this study of worker-adjustment, several large industries have set up a counseling program which assists workers to solve their individual difficulties. The results have been most satisfactory in terms of production.

Personal problems are personnel problems. This proposition bridges the gap between industry and the military. Daily, the armed forces are giving more notice to the "personnel-morale" techniques developed by prominent non-military organizations. Impelled by the growing spectre of limited manpower resources, the Army is clearly committed to the maintenance of well adjusted soldiers. Fighting men, too, accomplish much more in their tasks of war and combat if they are well adjusted to military life. On the other hand, we know only too well the damaging force of the unsolved personal problems of the maladjusted soldier.

At the beginning of the recent war period, the War Department, though recognizing the need of doing so, could not possibly pay very much attention to the difficulties of the individual man. The great task of building a huge fighting machine almost overnight obscured all of the smaller issues. The military mind was necessarily thinking more in terms of units than of the personality of the individual. The vital question was: How many divisions can we get into the field, and how quickly?

Later on, the dust of sudden mobilization cleared, and the new problems of administering our vast army took shape. The important relationship between good morale and soldiers who are well adjusted to the army began to stand out more and more clearly. Millions of young men were suddenly faced with the task of fitting themselves to a mode of life for which they were utterly unprepared. Most of the inductees gradually moulded themselves to the pattern of army life and became efficient soldiers. However, there were always some who couldn't make the changeover by themselves. It is important to remember that training alone doesn't make a soldier. The training simply stimulates something within the man whereby *he* makes a soldier of *himself*. The man who does not become a soldier after the period of training, fails for lack of sufficient direction and drive within his own personality. This may be due to a native

defect, or it may be caused by some problem or worry which is confusing his mind. In either case, good counseling can well be the remedy.

Left on his own, the badly adjusted man becomes discontented and often neurotic. Always, the uncooperative attitude and inefficiency of misfits make costly inroads into the effectiveness of the unit. They are sources of infection which constantly threaten to destroy the morale of a command. During the struggle for victory, it was not easy to give enough help to the problem case so that he could overcome his mental stumbling block and take his place among the well adjusted fighting men. Often his emotional instability was not apparent until he cracked completely under external pressure, and became a casualty. Then, although the psychiatrists were able to do much to repair the damage, he was a loss as a fighting man . . . The case histories which we shall give later on will show how easily this sort of thing can happen. It will demonstrate how necessary it is that every commander is always on the lookout for the man who gives the slightest indication of maladjustment. The value of an "ounce of prevention" is tremendous in these cases.

At present we have the time to study the lessons of the past six years. From them it is easy to see that a great deal of badly needed manpower, which would otherwise be lost, can largely be saved by an early willingness to help the maladjusted soldier fit himself to the needs of military life. This desire can be translated into action by the maintenance in the army of a well balanced counseling program, similar to that used to such good advantage by modern industry. To develop the theory underlying the army's counseling plan, we shall propose answers to two important questions: *Who* will do the counseling, and *how* will it be done?

In answer to the first query, it can be said that in general, all officers and noncommissioned officers are potential counselors. However, due to the nature of military life, it would be better to consider the company commander, the chaplain, and the medical officer (especially the psychiatrist) as those usually called upon to do this work. Effective counseling calls for a particular kind of relationship between the counselor and the subject. The latter usually seeks the aid of a man with whom he is not rubbing elbows intimately each day, but yet a man who he knows is interested in him. He normally wants a counselor who stands in relation to him somewhat as a father does to a son. The company commander fills this requirement. The noncommissioned officers and platoon leaders are, on the other hand, a little too close to the soldier to establish this type of relationship. True, in some cases they can give effective counsel, and they certainly are in a position to observe the maladjusted individual and call him to the attention of the commander. Then the latter can arrange to make the preliminary contact with the man in question.

It is not to be expected that the prospective counselee will report to the orderly room, hat in hand, to ask the first sergeant's permission to speak to the commander about his personal problem. Some will seek him out informally, but the commander will have to take the initiative in most cases by developing a casual contact into a counseling interview. Never must a soldier who should receive counseling be brushed aside by an officer or a noncommissioned officer with the badly worn-out refrain: "Go and tell your troubles to the chaplain!" .

Certainly in many cases the help of the chaplain is indicated. He is by profession a trained counselor. In addition, he is given thorough instruction in the military aspects of this art during his training at the Chaplain School. Because of the chaplain's qualifications, the commander should

avail himself freely of his services. If after going over the case as completely as possible, the full adjustment of the soldier seems to call for spiritual orientation —which often happens—the company commander should seek the chaplain's assistance. To do this without a let-down to the counselee, without lapsing into the old "you have a case for the chaplain" cliché the commander explains that the chaplain's point of view will contribute much to the solution of the soldiers difficulty, will add to what has *already* been accomplished. That is to say, the commander must stress this theme to his counselee: "You and I have achieved a great deal together. There is no doubt that the chaplain can help us still further." Then he, himself, makes the arrangements for a meeting between the man and the chaplain.

All of us know that many soldiers who are struggling with themselves seek out the chaplain directly. In such instances, the chaplain will give all possible assistance to the counselee. Usually, however, he does not close the case without first arranging for an interview between the subject and his company commander so that the latter may make his contribution towards a satisfactory solution. It should be remembered that the commander and the chaplain must always work closely together in the task of salvaging the poorly adjusted individuals of the command.

Finally, some cases are found to be too complicated for either the commander or the chaplain to render effective help. It can usually be assumed that such men are seriously ill mentally. Hence, they fall under the jurisdiction of the medical officer. If he confirms the suspicions of the commander, he sends the *patient* to a psychiatrist. Indeed it is fortunate that we have at last come to regard mental illness as just that. Today, we realize that mental sickness is as common as bodily illness; that it can be treated and often cured just like any other disease. A psychiatrist is nothing more than a physician who specializes in mental ills and their cure.

The reader has perhaps noticed the omission of the Personal Affairs Officer in our enumeration of counselors. It should be borne in mind that contrary to a possible implication in the title, the primary mission of this agency is to provide administrative assistance and advice in specific cases. The soldier goes to him for legal help, and to inquire about his privileges under current Army Regulations. The field of the Personal Affairs Officer does not embrace the emotional adjustment of the soldier.

Before we begin to discuss the art of counseling, it is well to give some thought to the malingerer. The counselor must be gifted with much patience and wisdom if he is to separate the true malingerer, whose feigned troubles are a cloak for cowardice, from the man who is suffering a real emotional disturbance. It is only natural for the officer-counselor to let his inherent disgust for the coward obscure his understanding of the case of the man who is truly emotionally upset. This will happen unless he trains himself to approach each case without prejudice, and then forms his judgment as to whether the counselee has a real problem, or is merely fabricating troubles to avoid dangerous duty.

Now, if we can agree that counseling is usually done by the commander, the chaplain, or the medical officer (psychiatrist), we are ready to answer the next question: How will counseling be done? In other words, what is the best tried and proved technique? The reader has perhaps noticed that in this entire discussion, we have shied away from the use of the word advice and adhered to the term counseling *ad nauseam*. This has not been done without cause, for there is a difference in the meaning of these apparent synonyms, and in this difference lies a key to the technique of good coun-

seling. The literal meaning of advice is the bringing of another to one's own point of view. Counseling, on the other hand, means a *joint deliberation.* The counseling interview goes even farther. It places the burden of the discussion squarely on the counselee. For his part, the counselor fixes his attention not on any specific problem but directly on the individual he is helping. Furthermore, the counselor should notice not so much the intellectual state of the subject but rather his *emotional make-up.* He stimulates a conversation wherein the counselee gradually reveals his *feelings.* This is important because badly integrated emotions are usually the source of the trouble. The subject's *mind* is brought into play only to help him appreciate the maladjustment state of his *emotional side.*

In other words, the mission of the counselor is not to assist the individual to analyze and solve one particular difficulty, but rather to understand himself completely through a clear insight. Thereby, he assists his counselee to recognize the jumbled state of his emotions, his feelings; to reorganize them by himself and within himself so that he will be able to cope not only with the present obstacle which is of immediate concern, but with any future trouble.

Counseling relies mainly upon assisting the individual to build up his will to drive himself toward full development and adjustment. The counselor merely wished to help the subject to see and cut away the obstacles to his emotional balance, so that he can again move ahead and grapple successfully with the problems of life.

A twenty-three year old private began to develop such a degree of irritability, tension, and hostility toward the army as evidenced by his surly attitude towards his fellow soldiers that the company commander found it necessary to call him in for counseling. After the initial contact, he arranged for the chaplain to continue the interview.

The discussions with the soldier revealed that prior to his service he had lived in a typical small community, where his basic social adjustment was very poor. He found it very difficult to engage in many of the ordinary social activities and devoted much of his time to farm work, hunting and fishing. Since early manhood, he has used alcoholics rather often, and occasionally became drunk. While overseas, he learned from reliable sources that his wife, to whom he had been married several months prior to shipping, was living with another man. This infuriated him and made him wonder why he couldn't go home and kill both of them. The *insight* which he developed while he discussed his problem with the counselor made him realize that he was transferring his feeling of resentment and hostility *from* his unfaithful wife *to* the army. The intensity of this transfer was heightened by his innate feeling of frustration. Once he began to understand the emotional conflict that was affecting his life, he slowly but definitely adjusted himself and became a normal, satisfactory soldier.

The "non-directive" type of counseling asks that the counselor inject himself into the interview only enough to encourage the counselee to understand his defective emotional pattern by describing it at length in his own words. This technique operates on the premise that only by explaining his emotional confusion himself, can the subject understand it clearly enough to cope with it.

A twenty-three year old infantry sergeant had been in the line with his unit for twenty weeks. His combat experience was extremely harrowing and he became progressively more fearful and nervous after each engagement. Toward the end of the period under consideration, his state of depression, sleeplessness, and irritability made it clear to

the company commander that the man was in need of counseling. He was sent to the Battalion Surgeon for examination. In the first interview, he frankly stated his problem: "I can't fight any more. It's got me down. I'm afraid that a shell fragment will strike me and blind me."

In the course of the contacts, it became clear that the counselee was a rigid, compulsive personality, who wanted everything carefully arranged. He had always been very particular about the cleanliness and orderliness of his surroundings. Paralleling this characteristic, he revealed the tendency toward anxiety. He had always been, the interviews indicated, reticent, fearful and insecure. During his past life, he had used his compulsive nature to compensate for his anxiety. In combat, when it became impossible to maintain the standard of cleanliness and orderliness that he needed, his complusive defenses broke down, and he fell prey to his anxiety.

In speaking of his family, the counselee revealed that his mother was a rigid, fanatical type, who had beaten him frequently. The parents were separated when he was four years old, and he subsequently acquired a stepfather who gave him little sympathy.

The counseling interviews gave the soldier a chance to talk out his difficulties, to understand the makeup of his personality by explaining it to another. This newly acquired *insight* into his inner self enabled the man to regroup his forces, and adjust his own emotional life to his surroundings. He soon lost his symptoms of maladjustment, and made himself into an excellent soldier.

It should be pointed out that if the company commander had the time and ability, he could have handled this case himself with equal success.

Always the basic rule for the interviewer is: *Be a good listener!* In addition, the following detailed principles are suggested for army use. Some of them have been borrowed from the guide to personnel counselors of the Western Electric Company; others were formulated after considerable discussion among a group of officers who are actively interested in the need of a sound counseling program in the army:

(1) The purpose of the interview. From the outset, the maladjusted soldier is informed that the counselor does not have the answers, but that the counseling situation does provide a place where the individual can, with assistance, work out *his own* solution.

(2) The interviewer should listen to the soldier in a patient, friendly, and unbiased manner.

(3) The interviewer should not display any kind of authority.

(4) He should not argue with the soldier.

(5) The giving of advise should be kept at the absolute minimum. The ultimate object of counseling is to redirect the subject's thinking so that *he* will ultimately provide *his* own solution without the counselor's advice.

(6) He should talk or ask questions only under certain conditions: To help the soldier talk; To relieve fears which may be affecting the soldier's relations with the interviewer; To veer the discussion to some essential topic which has been omitted or neglected.

It is certain that a careful study of and some practice in the application of these principles should equip the reader to do a good service in the important task of making many who would otherwise be a burden on the army and on themselves into good men and useful soldiers. Today, and still tomorrow, the need is for a sound spirit in a sound body.

Air Force

Beach Party

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GENERALLY speaking, there is no standard supply organization in the field which is common to all theaters of war or all types of operation. It is proposed to discuss here one aspect of the supply organization problem—that of Air Force supply across a newly taken beachhead—and the solution to that problem for Operation "Dragoon," the invasion of Southern France.

First let us examine some of the limitations of supply. By its very nature supply is comparatively slow moving. Matériel must be designed, raw materials procured and then manufactured according to the designs of the engineers, and in the quantities requested by the supply planners. Finally these supplies must be delivered to the users who may be 8,000 miles distant. The wide range of equipment used by an air unit coupled with the constant change in model and type due to the ever changing aspects of modern warfare is another limiting factor of supply. The highly technical nature of air matériel plus the need for close stock control create a need for trained supply troops to receive, segregate, store and issue this air matériel—a third limiting factor.

Air supplies were shipped to England before any supply organization had been established there which could adequately handle this supply build-up. As a result accurate control was impossible and spare parts and equipment were scattered over the various storage areas with neither rhyme nor reason. When air operations were started, this resulted in many aircraft being grounded for lack of parts—parts which actually were in England but which could not be located. So emergency requisitions were submitted to the United States, a costly duplication of effort, time and matériel. This chaotic condition was ultimately cleared up with the arrival of adequate supply units. In North Africa the same situation was created. Supplies were landed before supply troops, and again planes were grounded for lack of parts which in reality were present in the storage areas around the various airdromes.

In the operations on Sicily we began to see the light of day. During the later planning stages a liaison section consisting of seven officers and thirty-three enlisted men was set up to work with Seventh Army on the beach. Their job was to watch over air supplies as they were being landed along with the army supplies in order to facilitate the location and handling of these supplies when the air supply units ultimately arrived. This liaison section, while set up on paper in the planning stage, was not actually organized until a few days before the invasion, and did not work with Army until after their arrival at the far shore. It proved, however, to be of great assistance in keeping down losses of air supplies. In the invasion of

D-day, Gela, Sicily. (Signal Corps photo.)

Italy and Salerno, another step forward was taken through the creation of an advance section of the Air Force Service Command which attempted with a fair degree of success to segregate and control air supplies and direct air units to the proper locations. In both the Sicilian and Italian operations the great weakness of these advance units was the fact that they had not trained especially for the invasion; they had not worked with the Army prior to the landing and the units were made up of personnel drawn from several air service units regardless of any special qualifications. For the Overlord operation against Northern France, the IX Air Force Service Command set up Intransit Depot Groups which were attached to the Army's Engineer Beach Brigades. These intransit groups were patterned after the RAF Beach Parties and were organized three months prior to D-day and operated very successfully in receiving, segregating and issuing air supplies. Their greatest weakness lay in their apparent lack of administrative control over newly arriving air units. As a result, units coming in over the various beaches frequently lost several days in finding their parent organizations. This difficulty was overcome by detailing liaison officers to comb the beach area for "lost" units.

The ground forces had met this problem of supply across a beach through the use of Engineer Beach Brigades. Engineer Shore Regiments and Engineer Combat Regiments.

These units were built up and reinforced in order to follow on the heels of the assault waves and organize the beaches so that vital supplies could be forthcoming with minimum delay. They were usually

in direct support of the division or corps making the landing and were responsible for organizing and developing the supply and service phase of the operation. In contrast to this concept, the requirement for air units is to have a beach party arrive after the ground forces (how soon depends on many variable factors—how much opposition on the beach, the relative urgency of air operations on the far shore, etc.) but in advance of the air tactical units and then in conjunction with the ground beach party develop the supply and service phase for air in order to be ready for the arrival of the air tactical units. The combined beach party operates the beach until the arrival of the appropriate communication zone activity.

For the operation "DRAGOON," the amphibious assault on Southern France conducted by Seventh Army supported by a Naval Task Force and elements of the Mediterranean Allied Air Force, the Commanding General, XII Air Force Service Command (AFSC) was directed to facilitate movement of air force units and supplies over the beaches in the target area. A beach party was set up with the mission of facilitating and expediting the reception of, and routing to correct destination of, all air force units; and the segregation, disposal to beach dumps and inventory of air force supplies arriving over the beaches. This beach party was attached to Headquarters, Beach Control Group,

Establishing a beachhead in Normandy for Operation "Overlord." (Signal Corps photo.)

Seventh Army; this being the organization devised by the Army to coordinate, control and direct the activities of the various beaches. There were three Air Force officers on the beach staff of the Commanding Officer, Beach Control Group, the senior USAAF officer acting as commander of the Air Force Beach Sections with the Army Beach Groups. In accordance with the Army's plan of operations to land over three beaches with each beach to be operated by a Beach Group composed of an Engineer Combat Regiment with attached units, the XII AFSC organized three Air Force Beach Sections which were assigned to the Army Beach Groups. Each AF Beach Section was formed from personnel drawn from three USAAF Air Service Groups and from previously established RAF Beach Sections. The USAAF personnel was selected on the basis of qualifications in a particular supply branch as well as excellence of morale and character. These Beach Sections were placed on duty with their respective Engineer Combat Regiments five weeks before the operation and participated in such phases of the Engineer Combat Regiment's training programs and exercises as were deemed applicable. This combined training "paid off" during the actual operation in smooth operation, reduced supply losses and close control of critical supply items. Each Beach Section was composed of three officers and eighteen enlisted men and an RAF Beach unit of two officers and twenty-five other ranks with the senior U.S. officer commanding. The Section was under the command control of the commanding officer of the respective Engineer Combat Regiment and under technical control of the Air Force Staff Officer with Headquarters, Army Beach Control Group. Each Beach Section was provided with four ¼-ton trucks, and tentage provided by their parent unit. The RAF Beach unit had their own organizational equipment.

In carrying out the general mission of facilitating movement of Air Force equipment, supplies and troops over beaches the Beach Sections performed the following specific tasks:

a. Advised the Beach Groups on location of beach dumps for Air Force supplies and arranged for equipment and labor (native) to work the beach dumps;

b. Erected previously prepared directional signs and manufactured additional ones as needed;

c. Made constant checks of all beach dumps (ground and air) for location and segregation of misplaced Air Force supplies and arranged with Beach Groups for transfer to the proper Air Force dump;

d. Maintained inventories of supplies peculiar to Air Forces in the beach dumps and submitted daily reports to Beach Groups and the Air Force Staff Officer, Beach Control Group, Army, who in turn forwarded critical item reports, i.e., aviation fuel and lubricants, oxygen, belly tanks, etc., to the Air Force Service Command on the near shore for action thereon;

e. Checked manifest information against quantities of supplies discharged from ship convoys to beach dumps;

f. Operated Air Force assembly areas;

g. Personnel stationed at beach exits directed vehicles bearing Air Force supplies to the proper beach dumps where it was unloaded and segregated by class and type and finally issued to the Air Service Group servicing the Air combat units.

The operation of the assembly areas is worthy of some further elaboration. It was here that the Beach Section Command Post was maintained and supervision of all Air Force beach activities carried on. An area large enough to hold the vehicles, equipment and personnel for two Air Groups was established and all units arriving on the beaches were immediately directed to the assembly area by Air Force guides. At this point they were checked in and submitted data pertaining to the number

of personnel, vehicles and weight of unladen organizational equipment. Unit commanders were then briefed as to the general tactical situation and directed to their destinations. All supply reports from units in the field were submitted to the Beach Section CP and there consolidated for forwarding to XII AFSC on the near shore. Because of their early arrival (D-day) and location near the beaches the Beach Sections were literally "gold mines" of information for Air Force and other troops by virtue of the current information files concerning location of air fields, dumps and other units. All air personnel returning to the near shore passed through the Beach Sections for embarkation. The close relationship between the Beach Sections and the Beach Groups which had started five weeks prior to the invasion was maintained by having the Beach Section personnel live with the Beach Group. As a result of this close coordination when either organization experienced a "jam" in their operations it was quickly cleared through combined efforts and equipment. In spite of all precautions, some Air Force supplies did get mixed with Army supplies. The most serious case occurred when improperly marked aviation ammunition was stacked with the Army's caliber .50 ammunition, causing an apparent shortage in the Air Force's supplies. However, the frequent checks made by the Beach Section personnel uncovered the truth of the situation and with aid from the Beach Group the ammunition was quickly issued to the proper dumps.

Pre-invasion plans called for early notification to the Air Staff Officer, Army Beach Control Group of departures of LSTs on the Air Force shuttle so that in turn Beach Sections could make arrangements with their respective Beach Group for trucks to meet the arriving vessels and expedite the transshipment of supplies to the proper dumps. This worked well as long as the notifications were received in advance of ship arrivals. Radio traffic was so heavy, however that sailing signals were frequently delayed for long periods or were never received. Each Beach Section Commander was furnished manifests for the ships due to unload over his beach and as a result loss of supplies were negligible and greater speed in handling supplies was effected.

The higher echelon of the Air Force Beach Party which was with the Headquarters, Beach Control Group, Seventh Army acted as follows:

a. Issued necessary memoranda giving information as to routing of units, manifests of arriving cargo ships, location of various headquarters airfields, etc;

b. Received and consolidated reports of status of supplies in beach dumps and arrival of units to higher headquarters;

c. Took necessary action on incoming messages and directives;

d. Made arrangements with Army Beach Control Group, Navy and Transportation Corps for necessary shipments to the near shore;

e. Made frequent inspections of Air Force Beach Section command posts, assembly areas, beach dumps and beaches;

f. Maintained constant liaison with Army, Navy and other Air agencies.

One of the lessons learned the "hard way" in previous invasions was the need for constant liaison between all commands at all levels. To prevent recurrence of difficulties met in earlier invasions the importance of liaison was impressed upon all concerned. Prior to the operation the Air Force Staff Officer maintained close touch: with Army Beach Control Group in connection with operating procedures, division of responsibilities, the tactical plan and combined training; with the planning representative of Mediterranean Allied Air Forces and Mediterranean Allied Tactical Air Forces relative to proposed operating procedures of Air Force Beach Sections for inclusion in administrative or-

ders to units participating in the operation; with the planning representative of the AAF Engineer Command relative to proposed airfield sites, anticipated construction progress, build-up of engineer aviation units into the target area, information on actual construction progress and changes of airfield sites during the operation; with the A-3 and A-4 of XII Tactical Air Command as to assignment of combat units to airfields, build-up of units to target area (arrangements were made for establishment of short wave radio communication between the A-4, XII TAC and the Air Staff Officer, Beach Control Group during the initial stages of the operation so that changes in assignments of combat units to airfields or areas could be rapidly transmitted to Beach Sections and the affected units and so that supplies could be diverted when necessary); with A-4 XII AFSC relative to phased build-up of supplies and units into the target area by location and for submission of reports; with Naval representative, Beach Control Group with reference to naval operations on the beaches; and with the RAF representative in regard to build-up of RAF troops and supplies peculiar to the RAF. Commanders of the Air Force Beach Sections coordinated with the Beach Group commanders for location of Air Force assembly areas and beach dumps. Where it was consistent with the tactical plan, these dumps were located so as to be convenient to the proposed airfields. Agreement was reached for allocation or equipment and labor by the Beach Groups to the Air Force dumps. During the operation itself these all-inclusive liaison efforts were constantly maintained.

A study of the Operation "Dragoon" from the air viewpoint indicates that the Air Force Beach Party made the logistical support of the air effort possible on an economic and efficient basis. Yet there were certain shortcomings experienced in its operation which should be corrected in future operations of this type. Although administrative orders of higher headquarters gave comprehensive instructions as to procedures in landing across the beaches, some confusion and delay was experienced because smaller units were not fully aware of what was required. A better marking system of Air Force equipment and supplies, especially for Air Ordnance items in order to prevent temporary or permanent loss due to the pecularities and hazards of off-loading convoys during the early days of an invasion and for rapid identification of supplies is imperative. Some of the delay in clearing beaches was traced to the lack of adequate communications between the Air Force Beach Party on the far shore and the near shore agencies responsible for dispatching cargo and personnel vessels. That is, vessels would arrive in advance of receipt of sailing signals by the Beach Section and as a result no vehicles were immediately available for unloading purposes. When notice of arriving vessels was reached in advance, trucks were on hand at the beach and the vessels were discharged with no delay either on Air Force trucks or vehicles provided by the Army Beach Groups. Another source of delay was the practice of units arriving in the early days with large quantities of unwieldly, unladen organizational equipment. This creates a cluttered beach and places undue strain on the transportation sections. No unladen organizational equipment should be allowed on LSTs when the tactical situation is critical, or at least until after D+7. A minor item in the planning stages but one which increases in stature during and after the landings is the matter of signs. As far as possible they should be made up prior to the landing in standard form with sufficient blank signs which can be filled in on the beaches as necessary. An adequate supply of easily read signs well placed will go a long way towards fa-

cilitating traffic conditions in and around crowded beaches.

Although the Air Force Beach Party and its Beach Sections were better organized and equipped for Operation "Dragoon" than in any prior operation, reports indicate that the organization could be improved with some additional personnel and equipment. An outline of a provisional Air Force Beach Squadron giving a breakdown of the squadron into a Headquarters and typical Beach Sections is herewith suggested:

HEADQUARTERS

3 Officers	Commanding Officer (acts as Senior Air Staff Officer on Army Beach Control Group) Administrative Officer Ordnance Officer
14 Enlisted Men	4 Clerks, Administrative 3 Drivers 4 Radio Operators 2 Cryptographic Clerks 1 Radio Repairman
Equipment	2 ¼-ton trucks and trailers 1 Radio SCR 299 1 Radio SCR 609 1 Motorcycle 5 Tents, pyramidal 2 Typewriters 1 Safe, field
AIR FORCE BEACH SECTION	(1 per beach to be operated)
3 Officers	Commanding Officer Administrative Officer Ordnance Officer
58 Enlisted Men	10 Ordnance supply clerks 6 Fuel and lubricants supply clerks 4 Air Corps supply clerks 5 Clerks, administrative 8 Drivers 5 General duty men (guides, traffic control relief, etc.) 20 Unit Control personnel (4-5 for each landing point)
Equipment	4 ¼-ton trucks and trailers 2 2½-ton trucks and 1-ton trailers 1 Bomb service truck 2 Trailers, bomb service 1 Motorcycle 3 Sets, 20 man cooking 2 Tents, squad 4 Tents, pyramidal 3 Typewriters 1 Radio, SCR 609

It is recommended that the following outline plan be kept in mind when organizing such an Air Force Beach Squadron:

a. Definition: An Air Force Beach Squadron is an organization specially constituted, trained and equipped for technical organization of beaches to regulate and facilitate landing and movement of personnel, vehicles and equipment on and over beaches to assembly areas and vehicle parks; to move and receive supplies into beach dumps; to select, organize and operate beach dumps initially, to establish and maintain communications and to evacuate casualties and prisoners of war over beaches to ships.

b. Command: The Beach Squadron should be attached to the Army Beach Group Control Unit from one to two months prior to operation, and should revert to the Air Force when Communication Zone agencies assume supply and service functions.

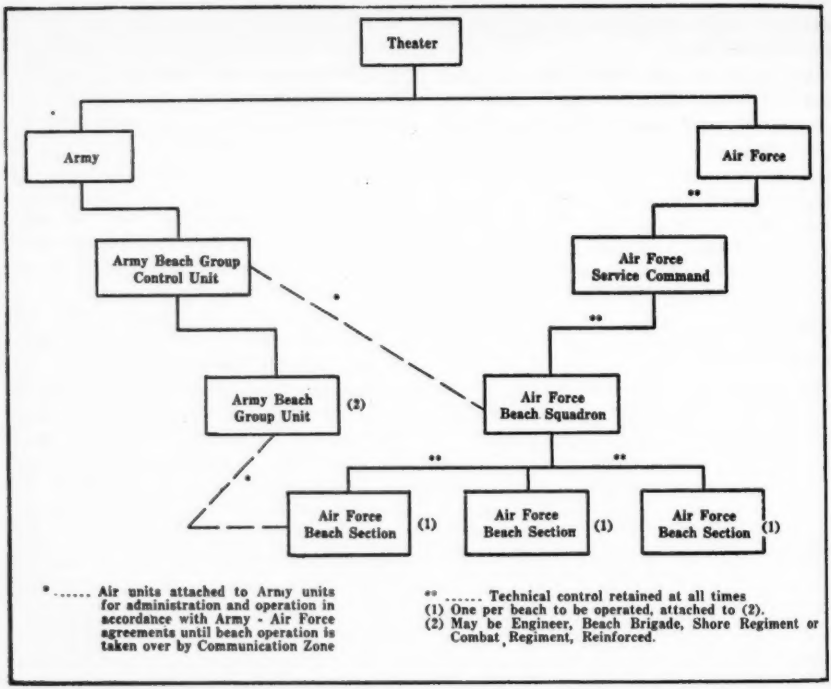
c. Planning: The Beach Squadron will prepare operational plans in conformity with Air Force directives and in close conjunction and coordination with the Army Beach Control unit in accordance with agreements set between Army and Air Force.

d. General Mission: To insure rapid and efficient movement of personnel and supplies across beaches in support of the overall landing plan of operation.

e. Tasks: Control of incoming supply and personnel build-up in accordance with Air Force plans and directives; traffic control; evacuation; operation of beach dumps; liaison with higher and lower echelons of all pertinent agencies as well as laterally; communications; assembly areas and vehicle parks; creation and operation of an adequate report system.

f. Organization: As outlined above.

g. Responsibilities: Commitments of Air Force to Army and vice versa as to supply, communications, transportation, equipment and personnel to be set up in original planning between Army and Air Force and carried out accordingly by Air Force Beach Squadron and Army Beach Control Unit.


Theater
Army
Air Force
Army Beach Group Control Unit
Air Force Service Command
Army Beach Group Unit
(2)
Air Force Beach Squadron
Air Force Beach Section
(1)
Air Force Beach Section
(1)
Air Force Beach Section
(1)
* ..... Air units attached to Army units for administration and operation in accordance with Army - Air Force agreements until beach operation is taken over by Communication Zone
** ..... Technical control retained at all times
(1) One per beach to be operated, attached to (2).
(2) May be Engineer, Beach Brigade, Shore Regiment or Combat Regiment, Reinforced.

Suggested Provisional Air Force Beach Squadron Organization.

h. Beach Maintenance Area: Beaches, beach dumps and connecting road net.

i. Beach Traffic Control: In accord with Army directives as promulgated by the Army Beach Control unit.

j. Beach Dump Characteristics: Large enough for adequate dispersal, convenient to beaches, to be so laid out as to permit free traffic circulation, ammunition and fuels to be separated and supplies segregated by type and class.

Thus we find that the key to overcoming the aforementioned limiting factors of supply is advance planning from the topmost command levels (both horizontally and vertically) down to the lowest levels. Organization and training of air supply units must be completed before the operation and the supply units must be placed on the beach *before* the arrival of supplies. The advance planning of the top air staffs must be in coordination with comparable ground and service staffs in order to assure the actual arrival of the air supply unit on the beach and for smooth operations thereafter, since in the early stages the ground forces must of necessity completely dominate the beach operations. Commitments by ground forces as to what they will provide for the air units by way of transport, supplies and real estate (storage areas, dumps, etc.) must be clearly defined and disseminated to all units concerned.

The author is indebted for valuable information and suggestions furnished by Major C. N. C. Ramsey, Senior Air Staff Officer in charge of the Air Force Beach Party for Operation "Dragoon."

Logistical Training Aids *in* *Map Maneuvers*

Lieutenant Colonel Thomas H. Magness, Jr., *Chemical Warfare Service*
Instructor, Command and Staff College

DURING the courses at the Command and Staff College, map maneuvers are held in much the same way as the laboratory work of a college course is conducted. They afford the student practical work in the classroom to cover the theoretical instruction that is presented.

The use of a time-equation in a map maneuver permits cause and effect of actions and orders to influence the course of the maneuver, during a short period of actual time. Where planning and troop movements are to be carried out, the play is not held back awaiting the elapse of actual time. During the early part of each course, the time equation is 1:1 but as the students became more proficient in map maneuver technique, the time equation is increased, so that later maneuvers may be played at as high a ratio as 1:6; that is, one hour maneuver time equals ten minutes actual time.

Students are assigned to various command and staff positions to afford them classroom experience in the nearest to actual practice that is possible in a school. However, the positions of the Commanding General, Chief of Staff and G-3 seem to appear to the students as most glamorous. The students in these positions order movement of troops, their development, and finally their attack against paper enemies (which are always destroyed). However, the question to the G-4 "Can you support the operations?", and his answer to the Commanding General has not always been in accordance with the logistical situation. Many troop movements took place without transportation being provided; many attacks were ordered without rations, gasoline and ammunition being available, either on hand or by timely movement to support the operation.

To insure that the G-4 would be able to advise his commander of the true status of supplies, and to introduce realism into play of map maneuvers to govern the logistical play and control the tactical operations, certain training aids have been developed and used. A method that has been successfully employed is to use supply cards for classes I, III, III(A), (aircraft) V and V(A) in combined map maneuvers. The cards contain two articles of information, the number of items, and their total weight. It must be realized that the provision of cards for each item of supply would be a Herculean task and would immediately bog down the maneuver. The cards are moved and expended (withdrawn from play) at the proper time as if the supplies were being used.

The weight of each class of supply played is based on a "representative value"; for example, rations are weighted arbitrarily at ten pounds per man per day. This increase in weight compensates in part for the daily requirement of Class II supplies. The total of the representative weights (pounds per man per day)

TABLE I

DENOMINATION OF SUPPLY CARDS *

HEADQUARTERS (UNITS)	CLASS OF SUPPLIES			
	I	III	III(A)	V **
	GREEN ***	WHITE	YELLOW	RED
Com Z Sec, Army Corps Air Force, Air Div, Wing.	500,000 rations 2,500 tons	500,000 gals 2,500 tons	500,000 gals 2,500 tons	1,000 tons
	50,000 rations 250 tons	50,000 gals 250 tons	50,000 gals 250 tons	500 tons
	10,000 rations 50 tons	10,000 gals 50 tons	10,000 gals 50 tons	100 tons
Army, Corps, Division, Air Division, Wing, Group.	50,000 rations 250 tons	50,000 gals 250 tons	50,000 gals 250 tons	500 tons
	10,000 rations 50 tons	10,000 gals 50 tons	10,000 gals 50 tons	100 tons
	1,000 rations 5 tons	1,000 gals 5 tons	1,000 gals 5 tons	50 tons
Division, Regiment, Battalion, Group (Air).	10,000 rations 50 tons	10,000 gals 50 tons	10,000 gals 50 tons	100 tons (Artillery)
	1,000 rations 5 tons	1,000 gals 5 tons	1,000 gals 5 tons	50 tons (Armored)
	100 rations 0.5 tons	100 gals 0.5 tons	----------	5 tons (Infantry)

* Cards should be of different sizes corresponding to their denomination.
** See Table II for Class V(A).
*** Card Colors.

shown on the cards will approximate actual conditions experienced in World War II. Cards are prepared in different denominations to provide "change" and to enable stocks to be counted easily. It has been found satisfactory in this regard to use not more that three denominations in a single maneuver. The denomination of the cards employed depends upon the scale of the maneuver. Suggested denominations of cards for use at various levels are included in Table I.

The following method of handling supplies has been found satisfactory in map maneuvers and is illustrated graphically in Figure 1.

Depots and Supply Points will be given their initial stock in the appropriate number of cards at the beginning of the problem (Figure 2).

As supplies are shipped forward, cards representing the proper amounts will be physically sent to appropriate installations or units where they will be placed in stock by participants representing that installation or unit. Cards will accompany all incoming manifests of ships in convoy to the various ports. Ports will plan to un-

load ships and move supplies to depots as directed.

During each maneuver day, participants controlling play at installations or units will consult with personnel controlling operations (and the enemy) and estimate the supplies expended or destroyed that day. Cards representing expenditures are then actually withdrawn from stock and turned into the central exchange. In case a unit desires to move some of its supplies from its own installation to other installations, it will issue appropriate orders to all concerned. When these orders are received, and depending upon the availability of transportation, labor, and supplies available as determined by umpires, the cards representing the supplies can be

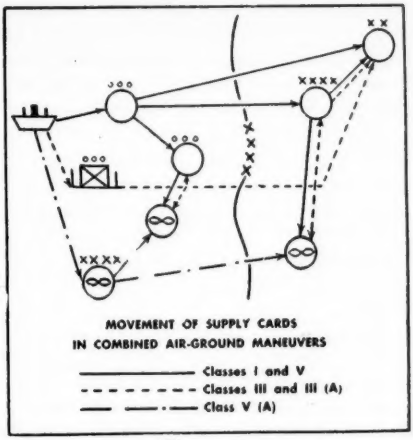


Figure 1.

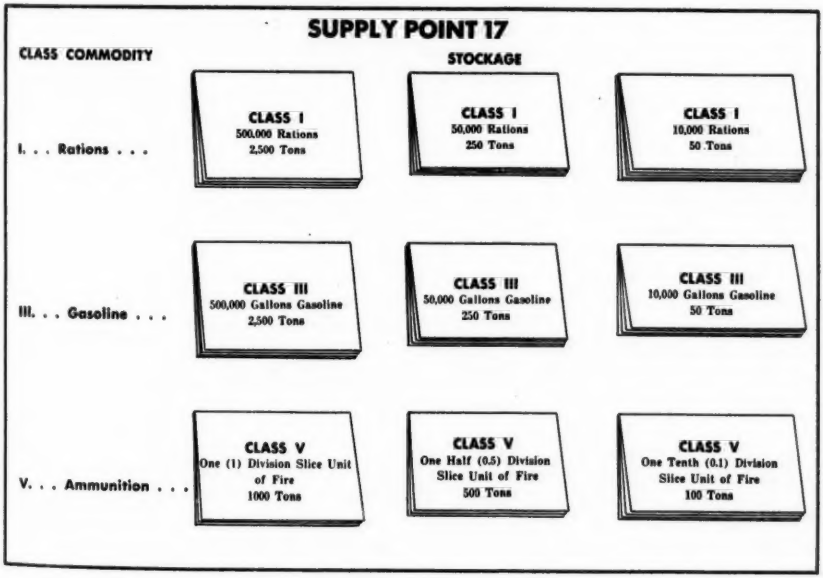


Figure 2.

physically moved to appropriate installations.

A central exchange is maintained by the maneuver G-4 where cards of large denominations may be physically exchanged for those of smaller denomination.

The use of a special combined form for map maneuver purposes assists and speeds up the handling and delivery of supplies as represented by cards. This form is a "Combined Requisition, Shipping Ticket and Bill of Lading" for different classes of supply.

The supply of ammunition in map maneuvers is a feature of logistical as well as tactical control. Details of supply must be coordinated with the level being played. It must be borne in mind that all types of ammunition in the field are allocated in rounds, and credits for a specified time are established for various units in accordance with their tactical missions. With the play in a maneuver on a division level, it is possible to employ certain representative rounds with arbitrary weights to take into account items not handled. With play on higher levels (corps, army and theater), a "division slice" unit of fire may be employed. By weighing this division slice at 1,000 tons it may be used to represent all ammunition to be expended by a division and its proportionate share of corps and army supporting troops in a given situation. A similar problem exists in the supply of aircraft ammunition. However, it may be necessary to break down Class V (A) into a minimum number of types of ammunition to take into account the various kinds of missions to be carried out. The director of the maneuver should prescribe and provide in advance the types and sizes of cards best fitting the requirements of the air units played in the exercise. Suggested denominations of Class V (A) cards are contained in Table II and Method of Expenditure is indicated in Table III.

The total weight shown on the cards makes the problem of computation of transportation requirements quite easy. For complete logistical play, the capacity of the means of transportation available, together with the time element, should be included. The time element should consider loading, marshalling, travel, unloading and distribution time to be complete. To add the final feature of realism, the provision of labor troops for these details should not be overlooked. The availability of all possible means of transportation should be indicated. The control of the means of transportation may also employ a simple aid such as an envelope, with notations as to means (highway, rail, pipeline, air, inland waterway) and capacity of equipment (total tonnage of a train of a standard number of railway cars, a truck company (battalion) or air transport group (squadron). The highway, rail, pipeline and water capacity should also be stated in the maneuver or situation in units per day, such as vehicles, trains, gallons, and vessels or barges.

The entire method of logistical play will break down or be useless unless reports of the status of stock are made at stated intervals. Each unit or installation should make reports of their stock status "daily." Suitable forms should be provided to furnish only the information necessary for control of the logistical support of the operation. Each headquarters is enabled thereby to consolidate this information and make reports to their higher headquarters.

Ammunition presents an entirely different problem again. If a "division slice" unit of fire is employed, the number of units of fire per division supported would furnish a method of control of stockage. However, if individual representative items of ammunition are employed, it is necessary to chart either the number of individual rounds on hand or the number of rounds per unit supported.

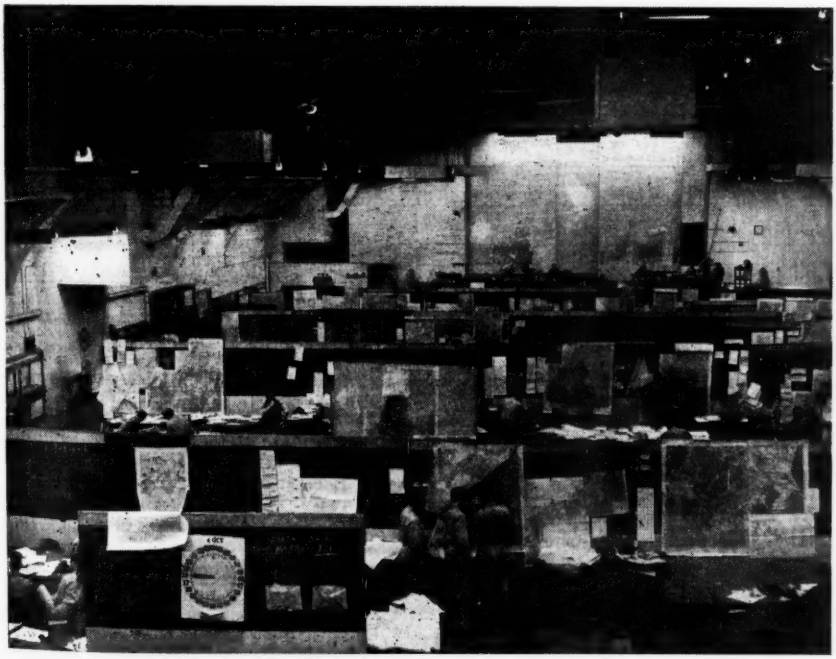
TABLE II

CLASS V(A)—AIRCRAFT AMMUNITION

Color of Cards—Red

TYPE	CODES	CARD DENOMINATIONS			
		SMALL CARD		LARGE CARD	
		ROUNDS	TONS	ROUNDS	TONS
Cartridge, 20-mm.	R1ACA	5,000	2	25,000	10
Bomb, GP, 100 lb.	S1HEA	200	10	1,000	50
Bomb, GP, 500 lb.	S1HBA	20	5	200	50
Bomb, GP, 1,000 lb.	S1HCA	10	5	100	50
Bomb, GP, 2,000 lb.	S1HDA	4	4	20	20
Cluster, Frag., 500 lb.	S1ZZO	20	5	200	50
Cluster, Incend., 500 lb.	------	20	5	200	50
Rocket, HE, 4.5"	S9CAB	400	5	800	10
Cartridge, API, .50 cal.	T11DC	50,000	10	250,000	50

Note: To reduce mathematics to the minimum, the weights of the rounds of ammunition shown above are for MANEUVER PURPOSES, converted to the nearest convenient number of tons.



Map Maneuver Set-up of Classroom.

TABLE III
EXPENDITURE TABLE—AIR

To use this table for expending supply cards for a given mission, multiply the number of aircraft of the specified type by the factor given in this table and expend the number of tons represented by supply cards nearest the answer.

Type of Supply	TYPE OF AIRCRAFT & LOADING TONS							
	B-17	B-24	A-26	P-51	P-38	C-46		
Bomb, GP, 100 lb.			0.8					
Bomb, GP, 500 lb.	3	3	1.5	0.5	0.5			
Bomb, GP, 1,000 lb.	3	3	2.	1.	1.			
Bomb, GP, 2,000 lb.	2	3.2						
Cluster, frag. 500 lb.			1.5	0.5	0.5			
Cluster, incend., 500 lb.	3	3	1.5	0.5	0.5			
Rocket, HE, 4.5".				0.1	0.1			
Cartridge, 20-mm.								
No Interception								
Light Interception					0.02			
Moderate Interception					0.04			
Heavy Interception					0.06			
Cartridge, API. .50 cal.								
No Interception								
Light Interception	0.3	0.2	0.2	0.1	0.1			
Moderate Interception	0.6	0.4	0.2	0.2	0.2			
Strafing Mission or Heavy Interception	0.2	0.8	0.8	0.3	0.4			
AVIATION GAS	10	10	3	0.5	1.0	5		

A TYPICAL EXAMPLE OF THE USE OF THIS TABLE

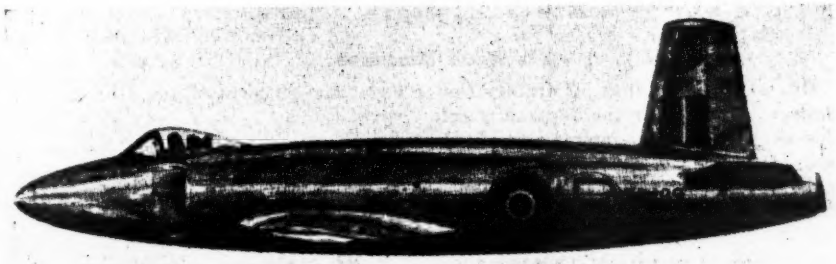
Player group orders a mission as follows: 2 Gps B-17's strike oil refinery.
Aircraft available—72.
Bombs selected—1000 lb GPs.
Interception met—moderate.

Expenditures:	*Number of supply cards to be expended:*
Bombs: $72 \times 3 = 216$ tons	43 small or 4 large and 3 small.
Ammunition: $72 \times 0.6 = 43.2$ tons	4 small.
Aviation Gas: $72 \times 10 = 720$ tons	14 (small—10,000 gal) or 2 (medium—50,000 gal) and 4 (small—10,000 gal).

MILITARY NOTES AROUND THE WORLD

GREAT BRITAIN

Latest British Jet Fighter



First flight photo of the Supermarine E 10-44, a jet fighter of new design built by Vickers Armstrong around the Rolls-Royce Nene I direct thrust jet engine. Using a laminar flow wing and a pressurized cockpit with ejector seat, the new British fighter is described as in the "better than 600 miles per hour class."

(Aviation News)

Wreck Dispersal

The British Royal Navy is in the midst of one of its most ambitious tasks, that of clearing the seas around British coasts of the numerous ships sunk there during the war. Though the Nazis failed in their attempt to stifle the shipping of supplies to and from the British Isles, they sent wreckage to the bottom of the sea which still endangers vessels now plying these waters.

Some of the hulks have been salvaged for the metal they contain. Others have been refloated, towed in, and made fit to sail again. Most of this salvage work is now completed.

The longest job remains—destroying those wrecks which cannot be extracted or are not worth salvaging. These must be disintegrated by high explosives, a dangerous task for the men of the Admiralty's Wreck Dispersal Department. Divers descend to the hulks to pack them with TNT, the explosion is set off, and the skeleton is finally laid, its danger to commerce over. A surveying vessel next examines the sea-bed to report on the success of the destruction, and the news is passed on to mariners all over the world.

Britain's salvage ships and craft now comprise the finest and largest fleet available anywhere, chiefly as a result of the

necessity of providing salvage services for Allied shipping all over the world during the war. Bases were organized in the United Kingdom, Iceland, the Faeroes, the Mediterranean, Africa, India, and the Pacific. Differing conditions called for differing equipment, since the problems of salvage in the Arctic, for instance, are unlike those in the Indian Ocean. In many waters there are tides to assist in lifting and removing wrecks. In the Mediterranean, where tides do not occur, other methods of lifting must be substituted.

The Salvage Department of the Admiralty includes a large number of skilled and experienced personnel, men who had their apprenticeship raising vessels sunk at Tripoli, Naples, Cherbourg, Dieppe, and other ports of northwestern Europe. With their modern equipment developed out of war necessity, they are able to undertake any kind of marine salvage work anywhere in the world.

(British Information Service)

GERMANY

Adult Education

One of the chief aims of Military Government is to teach the German people democratic principles and ways of life and to show them the fallacies of Nazi doctrines. Providing educational opportunities for adults through evening schools, university extension courses and residential high schools figures prominently in MG plans for achieving this goal.

Adult education in Germany was encouraged after World War I by the Weimar Constitution which stipulated that adult education be promoted by all levels of government "to give the citizens of the new republic that equipment in knowledge and in capacity to do their own thinking which they must have in order to discharge their civic duties and responsibilities." The Nazis also realized the importance of adult education as a propaganda weapon, and when they came to power in 1933, all popular education was placed unconditionally at the service of the Nazi State to form part of the program for training "leaders." Nazi statistics for the period 1936 to 1945 indicate that fifty-two million persons participated in the lectures, courses, film demonstrations and discussion groups held under the auspices of the *Volksbildungswerk.*

Steps Taken by Military Government

On laying the groundwork for organization of post-school educational institutions, Military Government officials started by dissolving all former adult educational establishments and screening their directors, teachers, and textbooks. As far as this could be done, schools were reopened, and twenty-nine evening schools for adults *(Abend Volkshochschule)* are authorized to operate in the U. S. Zone, the Bremen Enclave and the U.S. Sector of Berlin. Approximately thirty thousand students attend these schools. The curricula include foreign languages, fine arts, natural sciences, social sciences and practical courses such as typing and stenography. Only a comparatively small percentage of the students, many of whom are under twenty-five, are interested in social sciences.

High School for Adults

The first residential High School for adults has started its program at Comburg. This school offers former German soldiers a two-month course in political reeducation. Some of the foremost German public officials and educators will

address the students during the opening weeks on denazification, reconstruction of political institutions, present-day economic problems and future political tasks.

This program will be assisted by fifty men who were trained in democratic principles while they were prisoners of war in American camps. During their wartime internment in America, these former PW's studied various skills and trades and attended camp classes on democracy, political sciences and related subjects. These fifty men also held a four-day conference beginning 3 August at Comburg Castle to lay plans for utilizing in Germany the ideas and instructions they received in the camps in the United States.

Other Facilities Available

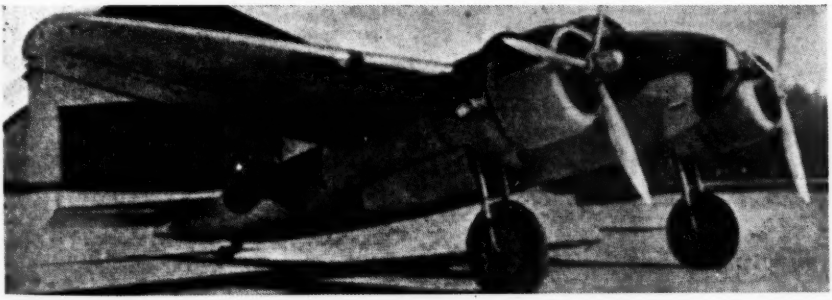
In addition to these adult education programs provided by institutions, there are a large number of other facilities in the U.S. Zone such as public libraries, discussion groups, lectures, historical research and other activities sponsored by MG-approved cultural societies.

The extent to which reorientation and reeducation of the German people will bear fruit is difficult to foretell. Only after years of consistently progressive teaching of democratic principles will it be possible accurately to evaluate the contribution of adult education to the rehabilitation of the Germans.

(German News Service, ICD)

ARGENTINA

Enterprise in Argentina



Built by the Fábrica Militar de Aviones (Military Aircraft Factory) at Cordoba, Argentina, which was established in October 1927, the I.Ae.24 "Calquin" (Royal Eagle) is a two motor monoplane built on lines similar to the De Havilland Mosquito. The Calquin has two 1,765 horsepower Pratt & Whitney twin-row radial engines, which give it a maximum level speed of 422.6 miles per hour. A bomb load of more than 1,750 pounds may oe carried internally, and the range is over 1,200 miles. The normal armament is four 20-mm forward-firing guns fixed in the lower nose section. Another product of the Fábrica Militar de Aviones is the I.Ae.22-D.L.55 single-motor two-seat training monoplane. The Argentine state factory has been turning out aircraft of its own design since 1932, and has also constructed American and German aircraft and aero-engines under license, since its inception in 1927.

(The Aeroplane, Great Britain)

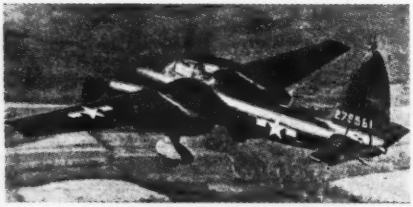
AUSTRALIA

Australia to Make Jet Planes

Australia has taken its first step in the production of jet airplanes of English design. Soon both the design and manufacture of a new type plane will be begun in Melbourne. This was stated recently by an aeronautical engineer of the Royal Air Force. He said the Vampire single engine jet-propelled type would be the first to be built here. Twelve engineers of the Commonwealth Aircraft Corporation now are abroad studying latest developments in this class of aircraft manufacture.

(Australian News Summary)

UNITED STATES



Kaiser Robot Attack Plane

Flight picture of the XBQ-1 (above) Kaiser Fleetwings Inc. experimental, radio-controlled attack plane developed for the AAF during the war. Note radio control antenna on vertical stabilizer.

(Aviation News)

Greatest Reserve Forming

A great Organized Reserve Corps, largest in the Army's peacetime history, is forming on a nationwide scale.

According to the ORC's T/O, twenty-five divisions, five of them airborne, will be set up. These will be in addition to the twenty-seven divisions of the reconstituted National Guard and to the sixteen divisions (including two of Philippine Scouts) which are now being maintained by the Regular Army.

The grand total of all regular and civilian components will reach sixty-eight Army divisions, all of them supposedly ready for action of any type anywhere in the world between M-day (Mobilization day) and M plus one year, or within one year after an emergency.

The Organized Reserves, like the rest of the post-war Army, is having growing pains, and so far relatively slow but steady progress has been made. Budgetary cuts, the general unsettled conditions in both military policy and military administration that follow every war, and the tremendous task of building up a reserve far larger than any hitherto known in peacetime—totaling 874,000 officers and men specifically assigned to organized units, plus a large unassigned group—have delayed progress.

Lack of sufficient armories and training facilities and, in some of the sparsely settled states, competition for personnel with the Naval Reserve, also of unparalleled peacetime size, are other difficulties.

Assignment to Six Armies

Gradually, however, the post-war reserve is being born, and it bids fair to be a lusty infant. Its core will be twenty-five divisions distributed for training and administrative purposes to the six armies in the country. There will be seventeen infantry divisions, three armored divisions, and an unusually high proportion of airborne divisions—five. The contemplated designations of the Reserve divisions and their assignment to the six armies follow:

First Army—98th Airborne Division,

76th, 77th, 94th and 97th Infantry Divisions.

Second Army—99th and 100th Airborne Divisions, 78th and 83d Infantry Divisions.

Third Army—15th Airborne Division, 81st and 87th Infantry Divisions.

Fourth Army—22d Armored Division, 90th and 95th Infantry Divisions.

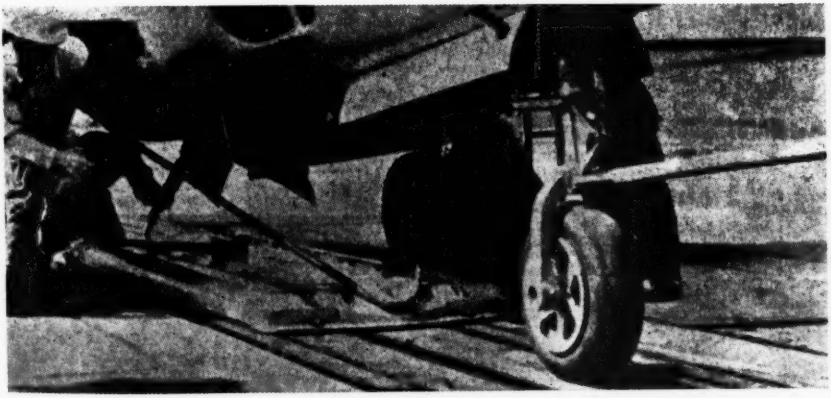
Fifth Army—84th Airborne Division, 21st Armored Division, 85th, 89th and 102d and 103d Infantry Divisions.

Sixth Army—19th Armored Division, 91st, 96th and 104th Infantry Divisions.

Thus the organized reserves will keep alive the designations of some of the famous units of the last war.

(Army Times)

Electric Catapult



Electric catapults that launch planes at high speed from a short runway have been revealed with predictions of small and revolutionary airports for future flying. Called the "electropult," the new catapult is a linear motor that has been installed at the Naval Air Test Center, Patuxent River, Md., and Mustin Field, Philadelphia.

Westinghouse Electric Corporation, who developed and built the electropult for the Navy, says that the new catapult will make possible floating airports, or seadromes for refueling in mid-ocean; barge-type airports at the water fronts of large cities; mid-city airports with an elevated "flight deck" several stories above the street; and the continued use of older airports requiring longer runways for bigger and faster planes.

Laid out flat along the ground, the electropult has a quarter-mile-long track. Planes are attached to a small car that runs on the track at high speeds.

Running free without a load, the car has reached a speed of 226 miles per hour in less than 500 feet. Attached to a plane, the car has sent off a jet fighter plane at 116 miles per hour in a run of 340 feet, compared with the plane's normal run of about 2,000 feet.

Declaring that the electric catapult gains in effectiveness as the size of the plane to be launched increases, it is said that designs are completed for electropults capable of launching the largest modern airliners. The largest airliner could be sent off at 120 miles per hour with a catapulted take-off run of 500 feet as

opposed to the 4,000-foot runways needed without the launching device.

The new launching system may eventually replace the hydraulic catapults used on U.S. World War II aircraft carriers.

The electropult was originally designed during the war to launch planes from small Pacific islands and was under construction when the war ended.

(Aviation News)

"Flattop" of Sky

America's very long-range bombers of the future will carry their own high-speed fighters.

The B-36, mightiest bomber yet developed by the army air forces, has been modified to become literally an "aircraft carrier of the sky."

Small but well-armed jet-propelled fighters will nestle in the bomb bays of the huge B-36 and be released for combat against opposing enemy aircraft when needed.

The revolutionary development now gives relatively short-ranged fighter craft an operating radius of nearly 5,000 miles —equivalent to that of the B-36.

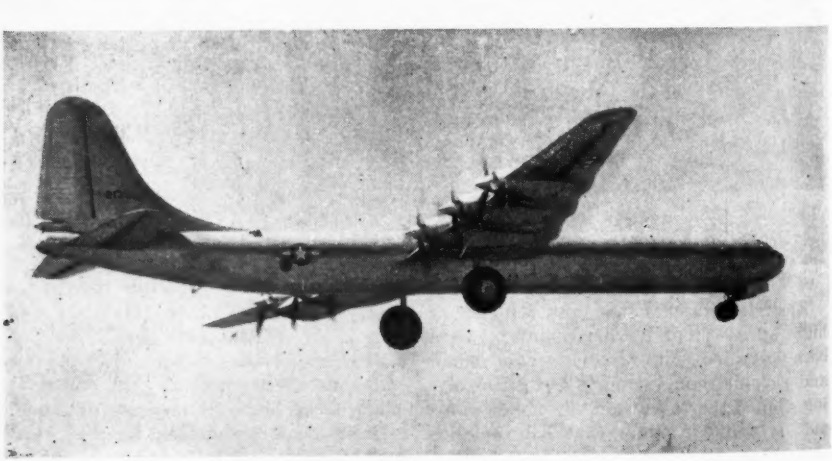
The fifteen-foot protector planes will have a top speed of more than 600 miles an hour. Their armament is a military secret, as are most of the details of their projected performance.

However, with the eighty-five-foot bomb bays of the giant B-36, each bomber can carry as many as four fighters. Airmen predict that future long-range bombing formations will be made up of fully loaded "aircraft carriers" protecting the fleet while some of the bombers carry only bomb loads.

This, in effect, gives America global capabilities for both offense and defense and adds additional punch to the power of the now-organizing A-bomb wing.

The wing will be equipped with B-36's as soon as the great bomber goes into mass production.

(From a news report)



B-36 in flight. (AAF photo.)

FOREIGN MILITARY DIGESTS

The Functions of the Navy in Support of the Security Council

Reprinted at the Command and Staff College from an article by Commander George Stitt, R.N. (Retired) in "The Fighting Forces" (Great Britain) October 1946.

THOUGH weapons may change and become more devastating, the functions of the navy must remain the same. Whether such a navy is acting under the orders of an International Security Council or whether it is acting solely for the state to which it belongs, the part it should play in any conflict is unalterable. Navies exist for the exercise of sea power, without which no nation can emerge victorious from a conflict. Germany lost the late war because she failed to grasp this fundamental fact and sought to impose her will through the predominance of her air force. The air, of course, plays an important part in the exercise of sea power, but it is the navy which will continue to play the dominant role in this respect so long as the maintenance of armies and air forces depends upon sea transport. It must be remembered that the correct application of sea power exerts a pressure which eventually decides the issue, however "continental" an opponent may be.

This statement, perhaps, is worth examining in order to understand what functions the navy may be called upon to perform in support of the Security Council. For the past fifty years there have been people who say that the development of modern weapons has made it possible for wars to be anything but swift, sharp and decisive. In 1914 popular opinion prophesied that World War I would be over by Christmas; the same was said again in 1939. Now, with the discovery of the atomic bomb, the contention is again advanced that any war of the future must be of short duration. That being the case, the very existence of fleets would be superfluous, as the atomic bomb, it is argued, would so paralyze the country attacked that her powers of resistance would crumble during the first days of hostilities.

Such an argument is dangerous. Indeed, any war plan based on this contention would lead to disaster, because if it were accepted, there would be no point in developing a navy. The chance of an enemy winning a war by a short and sudden blitz is still remote, and it would therefore be a wise insurance when planning for any future hostilities to suppose that they will be prolonged. And it is in a prolonged war that the effect of sea power is decisive.

Had we not been able to transport men and supplies, fuel, aircraft and all the paraphernalia for the erection of airfields during the last struggle, and had we not been able to deny to the enemy similar facilities, the war could not have been won. Germany could not invade Great Britain in 1940 because she did not possess command of the sea; she was unable to support Rommel because she neglected naval protection in the Mediterranean; and the successful invasions of Sicily,

Italy and Normany were possible only because the Allies had complete supremacy at sea, as well, of course, as air superiority. Though, in the future, the atomic bomb, if used, would cause unparalleled destruction, it is the men on the ground who will eventually determine the issue —and they can do so only if sea power can create the conditions to secure their supplies and lines of communication.

If, then, the Security Council is to exercise control, it must have at its command the means to exercise sea power. This means can be supplied only if those nations—particularly Great Britain and the United States—who support the Security Council are prepared to provide all the power of their command in backing up whatever decision may be taken. The idea of a nation supplying only a quota to enforce the will of the Council would be ineffective—once a decision has been made the maximum force must be available to carry it out.

So it is possible to visualize a situation where the entire British Navy would come under the operational control of the Security Council. This, of course, would not mean that the whole fleet would one day sail away for some distant foreign base and leave the country defenseless. On the contrary, the defense of Great Britain would be important for the Security Council, and the British Admiralty would still administer, and supply so far as it could, and pay its own navy. But the advantage of being under the operational control of Combined Chiefs of Staff should insure the most economical use of the forces available to the United Nations.

More than that—it would insure that the actions of all Services, to whatever country they belonged, were governed by one common object. How often in the past, both during the late war and the one fought in 1914-18, have the three services each pursued an object of its own. These objects have often clashed; they always caused friction, weakened the national effort, prolonged the wars and produced unnecessary casualties. This common object, then, might be the defeat of the enemy by occupation of his territory. To whatever length the destructive power of modern weapons is taken, the fact will still remain that only by an occupation of his territory can an enemy be subdued, and every effort would obviously be made by the Security Council to achieve this aim.

The navy's job, and also that of the air force, would be to create conditions to make this occupation possible by obtaining command of sea and air. It would be ridiculous to launch a powerful expeditionary force across hundreds of miles of sea if it was to be sunk on the way or destroyed from the air. It would be just as ridiculous to land it, supposing it survived the dangers of passage, if the continual stream of supplies required to maintain it did not arrive; if the countries providing the men and arms were themselves threatened by invasion or blockaded so effectively that their factories were silent and their people facing starvation.

Of course, the amount of naval effort to be expended would vary directly with the naval strength of the power challenging the authority of the Security Council, and the more the power concerned resorted to atomic warfare the more that effort would have to be dispersed. Again, it would also depend on the part of the world where action had to be taken, but it can be accepted that only a great power would dare to defy the Council—and there are not many great powers who would do that.

If operations were confined to the Pacific and Far East, then the function of the navy would be to roam the seas with groups of well-protected aircraft carriers and long-range rocket ships (if they are ever devised), so as to weaken the enemy's air offensive and destroy as much of his

potential as possible, and sink, in conjunction with submarines, quantities of enemy shipping. Then, with good air cover —not necessarily overwhelming superiority—and complete naval supremacy and an adequate number of bombardment and close-support ships, the navy would escort, support and maintain whatever large military force was required for the land operation.

If, however, Europe was once more to be the battleground, then the navy's first offensive commitment would be to help build up sufficient air striking power in some adjacent country. Other roles, equally important, such as the protection and control of merchant shipping at sea, the capture or destruction of all enemy vessels, the clearance and laying of minefields and the launch of "strikes" by carrier-borne aircraft would meanwhile be pursued. For all such operations, however, the navy would probably have to work from widely dispersed bases on either side of the Atlantic if it had to face any serious atomic menace.

It is possible, of course, that the British Isles might themselves become untenable, but with the navy operating under the control of the Security Council and able to use any base in the Atlantic, such a disaster would not vitally affect it, though it would certainly prolong any war and postpone the date when the object for which the navy was working—the occupation of enemy territory by land forces—could be achieved.

Gradually, relentlessly, the exercise of sea power would begin to take effect. In conjunction with the air forces, the naval air arm, working closely with surface escort vessels, would get the better of submarines while swarms of other aircraft struck deep into enemy territory. Finally, the two services would create the conditions necessary for the final, overwhelming assault by the United Nations on the enemy's country.

In support of the Security Council the navy would thus exercise its age-old function, but with this difference—it would have more freedom to act, it would not be restricted by neutrality regulations and would be controlled by an international body acting through the Combined Chiefs of Staff and imparting to every service of every country a common object to be reached by a common strategical plan.

Accelerated Attack

Translated and digested at the Command and Staff College from a Russian article by Major General N. Ivanov in "Krasnaia Zvezda" (U.S.S.R.) 16 August 1946.

AN accelerated attack is an attack launched against hurriedly occupied and weakly defended positions held by the remnants of routed units, newly arrived reserves, or by previously detailed groups. These positions may be totally unprepared for defense from an engineering point of view. Some, however, may be well developed but occupied in a hurry.

Accelerated attack may be employed following meeting engagements with the enemy, terminating by his changing to defense, and in those cases when, after repelling hostile counterattacks our troops immediately attack the enemy engaged in digging in along the line reached during the attack.

What are the characteristic features of the accelerated attack? First of all, it is characterized by the defense's absence

or weakness of fortifications, shallower depth, imperfect cooperation among the participating units, gaps in combat formations and weakly covered sectors, especially on the flanks and near limiting points. Units changing to defense, as a general rule, have weak reserves, or none at all.

But the relative weakness of hurriedly organized defense does not at all exclude the necessity for a thoughtful approach to the organization of the impending attack. It should be remembered that the accelerated attack too, has its difficulties. Upon breaching the main zone of the enemy's position, the frontage of the attack usually lengthens considerably. Combat formations are characterized by small gaps between the units, while flanks and limiting points are often not covered at all. Considerable forces are used for blockading strongpoints still offering resistance, for encirclement and destruction of separate hostile groups, and for mopping-up operations. All second echelons and reserves may be committed while the attack echelon is considerably weakened. The amount of support artillery decreases. Part of it is transferred elsewhere, while some artillery batteries and battalions lag behind for one reason or another. Control of the artillery by this time is decentralized and its centralization cannot be carried out in a short time.

All this must be taken into account by the commander organizing the attack. The difficulties become even more serious because of the fact that the troops have very little time for the preparation for this effort. And if the commander fails, under the circumstances, soberly to appreciate weak and strong points of the enemy, this will immediately register in the results of the attack.

Here is an example: One of our units fighting in rear areas of the enemy had approached a hamlet occupied by the Germans. Since the enemy had been considerably mauled up, the unit commander decided to seize the hamlet by using the method of accelerated attack.

The area where our troops were concentrated was flat. There were no heights, buildings or trees which could be used for observation posts. In addition to this, small groves and gardens around the houses and estates among which the German troops were disposed, made observation difficult. To observe the enemy's position, the commanders had to use the first trench held by our advance force. But to determine the disposition of the enemy forces even from here was difficult.

For certain reasons our troops had the impression that the hostile main line of resistance passed in the vicinity of a certain estate and a grove. Therefore, our artillery and mortars fired strong concentrations upon these areas. These were also bombed and strafed by our aircraft. Artillery preparation lasted forty minutes, but when following this our infantry and tanks moved forward, they were met with a strong fire and were compelled to withdraw. The enemy had not been neutralized.

When darkness fell, the Germans left their position fearing new attacks. The following day in considering the causes of the unsuccessful attack, our command found out that the forward trenches of the enemy were located not near the estate and the grove, but near a ditch passing about 300-400 meters in front of the estate. The ditch was overgrown by small shrubs which completely concealed the trenches. It is true that the Germans in the depth of the position had suffered from our fires. In the vicinity of the grove and the estate there were several German self-propelled guns, totally wrecked mortars, and a number of soldiers killed by our artillery. But the advance units had not suffered at all, and that was reflected in the results of the engagement.

Furthermore, the attack itself was not well organized. Some units did not know

their missions and did not even participate in the action. Believing in the superiority of his forces, the commander of the attacking unit failed to prepare his troops, had not organized reconnaissance well enough, and as a result the attack was unsuccessful.

How does one organize an accelerated attack? First of all, a few words about reconnaissance. Its importance in the organization of accelerated attacks cannot be overemphasized. The commander must know beforehand where and what intermediate positions the enemy is likely to defend, what these positions are, and how they are fortified. Some data of this type can be obtained from aerial reconnaissance, but scouts can obtain much more information.

As for observation, which is carried on before and during the attack in areas concealed by trees, groves, and buildings, the troops should rely on balloons and mast periscopes several meters high.

After the enemy had been routed at the main defense zone the mission of the attacking units consists in not letting the enemy rest, and in preventing him from fortifying an intermediate position. Consequently, the preparation of the accelerated attack should taken on an average from eight to ten hours and not more than twenty-four hours. During this short period of time, one can solve all organizational problems, especially if these have been talked over before the breakthrough of the main line of defense.

Let us consider the experience of some of our units. In the majority of cases speed of action and success of accelerated attacks were achieved by a well organized redistribution of all elements of the battle formation. Behind infantry units and tanks moved officers with signal, observation, and engineer personnel. If the enemy tried to offer resistance on a new terrain line, they would immediately start the organization of observation, communication, and control. Thus, when the command post displaced forward, everything was ready for combat work. After reconnaissance, summation of the results of the observation, and some artillery survey work, the troops received their missions and all the necessary measures in connection with the setting up of cooperative action were carried out. Everything was done as it is usually done, but much faster.

Experience has shown that the line of departure for the accelerated attack is seldom less than 400—600 meters from the advance elements of the enemy. In order to provide artillery support for overcoming this stretch, artillery preparation should last from thirty to forty minutes. As soon as the riflemen approach the enemy to within 250—300 meters, the fire of the artillery is transferred to the next terrain line. In some cases the situations calls for massed fires of direct-laying guns, for emplacing hurriedly displaced batteries next to batteries already firing to enable the former to fire by the firing data of the latter, and for firing without registration.

There was another error often made by our commanders in carrying out accelerated attacks. The advance toward the intermediate position of the enemy was effected on a broad front with a uniform distribution of forces and without a definite direction of main effort. This was due to the inability of some commanders to regroup their forces within the short time available, and because of a lack of data on the fire plan and fortifications of the enemy. It is expedient, therefore, even before approaching the hostile intermediate position, to decide upon the direction of main effort, and to establish a narrow frontage on the departure line for units making the main attack. In order to insure a higher density and a greater depth of combat formations, some of the

advancing infantry, tank, artillery and engineer units are rerouted toward the sector of the main effort. But one should not go into complicated maneuvers, requiring much time for their organization. The depth of echelonment in this case can be smaller than that in breaching defensive positions, but it should be deep enough to insure a continuous strengthening of the attack.

The main peculiarity of attacking positions which are built and occupied in a hurry is the employment of motorized and tank forces in the first echelon. The purpose of this is the breaching of hostile positions at the weak sectors and passing through the gaps between separate units.

To insure the element of surprise in the main attack, all preparations should be carried on in several sectors simultaneously. The enemy will know of the impending attack, but will never guess the direction of main effort. If more time is available, tanks and artillery may be assembled in the evening in plain view of the enemy somewhere in a secondary sector and then moved to the sector of the main attack.

The accelerated attack is characteristic of the modern war of maneuver, and our troops should be well versed in the fundamentals of this form of attack.

Rocket or Jet Drive?

Digested at the Command and Staff College from an article by Major Oliver Stewart in "The Navy" (Great Britain) October 1946.

NAVAL aircraft, like many other kinds of aircraft, must soon be making a choice between rocket and jet drive for certain tasks. One of these tasks is interception. Will the turbojet or the rocket power the interceptor aircraft of the future?

It seems remarkable that so soon after the coming of the gas turbine we should be considering another kind of prime mover altogether—and an extremely ancient one at that. Yet that is the position. Attention is turning towards rocket motors and there can be little doubt that large developments with these motors are imminent.

Both the rocket and the gas turbine may drive by jet; that is by recoil or reaction. They both propel by moving a body of air mixed with hot gases backwards. There is no fundamental difference in their mode of propulsion. But there is a difference in their mode of operation. It consists of the fact that the gas turbine consumes air which it takes in from the surrounding atmosphere, while the rocket carries its air with it—perhaps in the form of liquid oxygen.

Gas turbines may turn an airscrew and therefore propel by a combination of airscrew and jet; but such propjets are not challenged by the rocket for they are medium speed, long range devices; whereas the turbojet and the rocket are both ultra-high speed devices.

Until quite lately it has seemed that the turbojet—a unit like those which are fitted to the Meteor aircraft which broke the world speed record—would be capable of giving man-carrying vehicles all the speed that could possibly be wanted. They can give speeds up to the speed of sound—which is 742 miles an hour at 0° centigrade at sea level—and it is likely that they will eventually pierce the so-called "sonic barrier" and give supersonic speeds.

Speed, being the first requirement of the interceptor fighter, determines the

kind of power unit that will be employed. If the turbojet can give these speeds, why should the rocket be required?

The answer is that there is another region of high speed altogether, and it is only just coming in sight. It is a region of enormously higher speeds than anything we have known yet. It is the region of V-2 speeds, which exceed 3,000 miles an hour.

Turbojets will no doubt give us aircraft doing 1,000 kilometers an hour this year. They will give us aircraft doing 1,000 miles an hour in the not very distant future. But they will not—so far as can be seen at present—give us aircraft doing 3,000 or 4,000 miles an hour however intensively they may be developed.

Yet it is an undeniable fact that, if speeds of 3,000 and 4,000 miles an hour are attainable, they must be used by interceptor fighters. All interceptor fighters, naval and other, must be capable of the highest speeds of which man-carrying vehicles are capable.

There would be no difficulty at the present moment in building a man-carrying vehicle to do speeds somewhere near those of V-2. But it could not at present be landed safely. It would have a rocket motor and would behave much as V-2 behaved; that is to say it would begin its flight by ascending almost vertically. It would turn on its course somewhere near the top of its trajectory, where its speed would be at a maximum.

An interceptor fighter of this kind has been designed by the Germans. It was for tackling bomber formations and the aircraft was rocketed into the air up a steep ramp. The pilot, after making his attack, returned to earth by parachute. This machine had an amazing rate of climb and an exceedingly high top speed. It can hardly be doubted that it will prove to be the first of a new kind of interceptor fighter.

These ultra-high speeds are related to height. That is the essential point to be grasped. It is only by going very high that V-2 could do such high speeds. And it will only be by going very high that man will do them. He will be, of course, enclosed in a pressure cabin. Ordinary turbojet aircraft do their best speeds close to the ground. That is because they work on this side of the sonic barrier. If they should get through the speed of sound, the situation would alter.

De Havilland "Swallow" jet-propelled plane designed for supersonic speed. (Illustrated London News photo.)

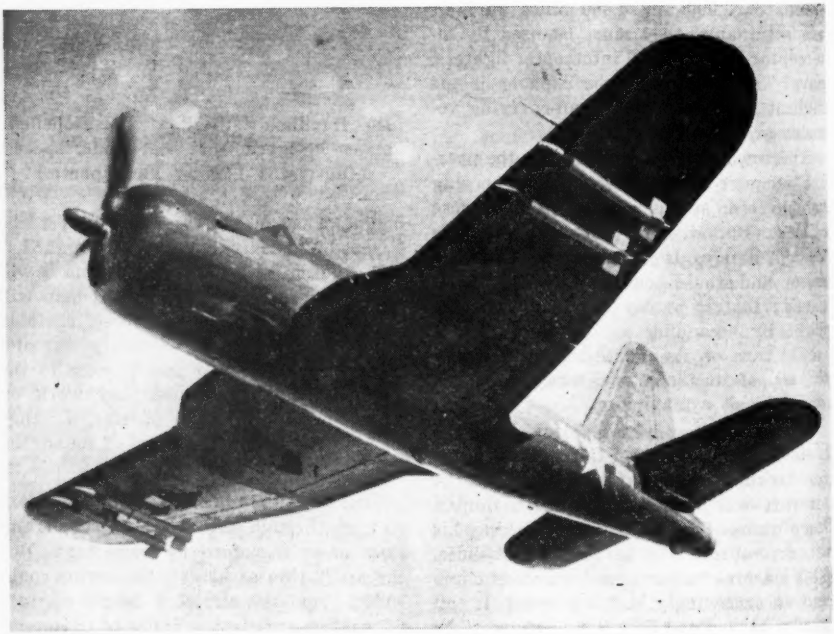
The new ultra-high speed interceptors will go through the speed of sound and they must therefore fly very high. But the air is thin at height. No engine could collect from the air, at a height of, say, fifty miles, sufficient supplies of oxygen to keep it going. Hence the turbojet is ruled out for ultra-high speed flight at great heights.

The argument may be summarized thus: if there are to be such things as interceptor fighters among the aircraft of the future, they must be capable of ultra-high speeds, speeds well beyond the speed of sound. To achieve such speeds they will have to fly very high as V-2 did. But to fly at such heights they must be rocket driven, for the turbojet would not be able to function in the rarefied air.

It will be seen that there is a complete case for the rocket motor. It is going to be the high speed motor of the future and the sooner it is developed the better. The Germans have done more work on rocket motors than anybody else and have been more advanced in their scheme for using them. They are the pioneers of this kind of drive and of the method of using extreme altitude in order to gain extreme speed.

The rocket motor can be an elaborate mechanism. Although it is fundamentally the same as the rocket motor used through the centuries in firework displays, it is incomparably more complex in structure and working method. It uses fuel lavishly. Indeed people doubt its value because of the enormous quantities of fuel it consumes per second. But they forget that it counter-balances this great fuel consumption by its capacity to give ultra-high speed.

If by running a few seconds a rocket motor can provide the height and speed to travel a long way, that is all that is



FR-1 "Fireball," a propjet type. (U.S. Navy photo.)

needed. If the range is there, there is no need whatever for the duration. Duration, indeed, is the one thing we want to avoid if we are going for ultra-high speeds. The object is to get the journey over in a minimum of time.

Transport aircraft, and bombers if they are not considered obsolete, may for a long time be of the conventional kind and be driven by turbojet. (I am doubtful if the propjet will long find a use.) But the interceptor fighters must be rocket-driven. Many difficult problems have to be solved before they can be held to be practical aircraft—among them that of providing means to make a safe landing. But these problems will be solved, and I predict with the utmost confidence that interceptor fighters of the future, both land based and ship based, will all be rocket-driven.

The Evolution of the Engineer Branch During the War

Translated and digested at the Command and Staff College from a French article by General Jaubert in "Revue de Défense Nationale" (France) August 1946.

THE whole of the activity of the Engineer Branch, during the recent war, was characterized by the fact that, equipped with large quantities of efficient machinery, it has transferred the modern factory to the field of battle. From the point of view of the strength of its personnel complement and of the large amount of matériel employed by it, the Engineers have emerged from this war in a considerably expanded state.

It is curious to note that a like evolution was also noted after World War I, but that, little by little, between the two wars, the lessons of the first were forgotten, and the Engineer Branch returned to its former obscurity. The problem of mine removal had to arise before this branch was again brought into prominence.

The causes of this redevelopment of the engineer branch are numerous, but one thing is strikingly evident. The relative importance of the various missions of the Engineer Branch underwent such a profound change during the war that it emerged as the communications (maintenance of routes) branch. This mission leaves all others far in the rear, and is the direct consequence of the changes brought about by war.

The period of stabilization of World War I which, on the French front, extended from October 1914 to March 1918, had firmly anchored in the public mind the idea that war was mainly fought in trenches. The Engineer Branch participated largely in the tasks of organization of the ground and attack of fortified positions which seemed, at that time, to constitute its principal missions. The periods of movement had revealed the existence of a communications problem, but had not brought out the amplitude of it. The demolitions met with in the spring of 1917 or the summer of 1918 were aimed principally at the slowing down of motorized supply columns. Their effect on combatants on foot or on horse-drawn vehicles that were not bound to the highways was almost nil. Between the two wars, the increase in the number of vehicles, restricted to a greater or lesser extent to the highways, increased the maintenance of routes of communication. It appeared therefore, logical that unless the Engineer Branch increased its personnel and matériel, it would have to abandon certain other missions in order

to concentrate its efforts on the maintenance of routes of communications.

Unfortunately, this idea was not agreed to by everyone. Possibly the immense task accomplished by the Engineers in the construction of the Maginot Line prevented some minds from seeing that further evolution would be imposed by motorization. Whatever the facts may be, the French Engineers went into battle in 1940 incompletely motorized and poorly equipped for their battles on the communication routes. The belief in defense behind the Maginot Line, financial difficulties, insufficiency in the resources of the national economy were responsible for this state of inadequate preparation.

Since 1940, the physiognomy of armies has undergone a complete change. The motor vehicle has come to play a predominant role to such an extent that, except in close-in fighting no one moves any longer on foot. Horses have almost completely disappeared. It is no longer solely the matter of supply and evacuation that justifies the employment of motor convoys, but also the movement of combat troops.

Consequences of Motorization

The number of vehicles employed and their speed have increased considerably and their movement requires a dense network of highways of good quality. A section of highway in bad state of repair causes delays and has serious repercussions on the movement of a column, because speed of movement is of prime importance.

The existence of armored vehicles makes it necessary that highways, roads, and especially bridges be in a good state of repair, and extend all the way to the front.

The continually increasing weight of armored vehicles obliges us to make provision for greater load capacities than we ever dreamed of before. The bridge of 1935 which permitted the passage of loads of eighteen tons is outmoded, because medium tanks require structures of a minimum capacity of thirty tons.

Bombardment aviation and airborne forces have increased the depth of the battlefield to a considerable extent. Damage to highway networks may be inflicted at distances of tens and hundreds of kilometers behind the combat zone and usually has a direct effect on the combat operations.

In the face of the growing number of vehicles, the highway network in existence at the present time has shown itself to be inadequate, not only in North Africa but also in Europe, as in the Rhone Valley.

Thus, from the immense and complicated problem of routes of communications, one conclusion only can be drawn. The maintenance of communication routes and the increased motorization and mechanization demonstrate the need for a special arm. This arm, quite naturally, is the Engineers.

Other Engineer Missions

Another mission of the Engineer Branch that merits special attention is the mission of the Engineer Forces in amphibious operations. This acquired great importance in World War II. The preparation of amphibious operations like that of all combined operations must be minute, and it requires a great deal of combined practice. As soon as the first elements land the Engineers go into action to mark the beach, clear away obstacles (particularly mines), build roads connecting with the highway network, organize the beach (installation of command posts, aid stations, supply dumps, antiaircraft and antitank defense, etc.), assist in the unloading of landing craft, and insure the defense of the beach.

Airborne operations have a certain analogy to amphibious operations, and the Engineers play a role in them which is similar to that of the beach engineers.

The Engineers assume responsibility for the removal of obstacles, and they must get airfields in order, a task analogous to that on the beaches, i.e., removal of obstacles, de-mining, filling of craters, etc. The technical work will be rendered even more difficult by the limitations imposed by air transportation.

We shall not dwell at any length on the forced crossing of rivers in the face of the enemy, since no important innovations in methods of execution, have as yet made their appearance.

This augmentation in the role of the Engineer Branch in the matter of communications and in special missions should render less and less probable its employment in organizing ground, which can be charged to other arms most of the time.

Equipment

The Engineers have been endowed with matériel consisting basically of numerous, very powerful and highly efficient machines (bulldozers, angledozers, scrapers, compressors, hoists, etc.). Some of these machines, handled by one or two operators, perform the work of fifty or sixty men. The operation of high-efficiency tools by a few men permits the acceleration of manual labor.

Explosives have improved and the use of hollow charges permits saving time in accomplishing demolition work.

Bridge matériel of various types for carrying loads above thirty or forty tons are now included in the equipment of our engineer units. This equipment was furnished us by the United States. It must indeed be acknowledged that to the majority of those who saw them unloaded at Algiers or Casablanca, they represented innovations. The majority of these machines had been in use on public works projects in the United States. They were but little known in our country. Our Engineers rendered unceasing praise of their good qualities, the relative ease with which they could be handled, and their performance throughout the entire war. It seems to us that it would be good policy, from both the economic and military points of view, to acquire and make use of the mechanical equipment in time of peace, which in time of war is absolutely indispensable to the modern Engineer Branch.

A special word of praise must be spoken for the "Bailey" bridge of English conception, in the perfection of which, the technical services of the "Royal Engineers" even surpassed their old reputation.

Organization

The evolution of the Engineers has likewise affected the constitution of its units. The great depth of the field of battle and of the communications zone demands the presence of Engineers all the way from the extreme front to the extreme rear. This has necessitated a considerable augmentation in personnel. Moreover, there can no longer be a separation between the engineers of the front and those of the rear. All engineer combat units should be interchangeable and have the same composition.

If men of good will start out from the same premises of agreed fact, they do not necessarily find it impossible to reach the same conclusion.

Winston Churchill

Pacific Front Line

Digested at the Command and Staff College from an article by Major Basil Hall, in the "Army Quarterly" (Great Britain) October 1946.

AT the time of the attack upon Pearl Harbor, Australia and New Zealand had accepted the inevitable and begun to garrison their own front line. With the bulk of their trained troops already in the Middle East, neither of them had much to spare, but the Commonwealth authorities sent a fourth division overseas to assist the British forces in Malaya, and acting in agreement with the Dutch, assumed responsibility for Timor, Ambon and the islands south of the Dutch New Guinea coast. This arrangement divided the defense of the Netherlands East Indies into three parts. With the right flank shielded by Australia, Malaya command took over the northern portion of Sumatra, thus allowing the Dutch to concentrate the bulk of their strength—said to be about 200,000—in Java, covering the naval base and arsenal at Sourabaya and the vital oil wells at Pelambang across Sunda Strait.

Neatly drawn upon a map-board, these dispositions looked well enough, but the weak point lay in the fact that the Celebes, Halmahera and Dutch New Guinea were more or less left to their fate. Nor was this all, for Ambon and Timor were only guarded by small Dutch forces, to which slightly augmented battalions of the Australian Imperial Forces (AIF) were added. In Ambon there were a thousand Australian troops, with about 1,300 in Timor.

On the eastern quadrant, which was essentially Australia's concern, a home-service battalion was added to a hastily recruited native force at Port Moresby; an AIF battalion with supporting units to a strength of 1,600 men was dispatched to Rabaul, while small detachments were placed upon Nauru and Ocean Island. Meanwhile the New Zealanders moved a brigade group to Fiji.

So the front line took shape, but in the very nature of its immense scope it could do nothing more than establish a number of defended points, all of which might be outflanked or overrun at the enemy's convenience. What happened is well known. Individual courage on land, sea and in the air had no chance against overwhelming odds, and within four months Japan extended her frontiers from the Indian Ocean on the one hand to the borders of Australia on the other. Of the original Singapore-Suva barrier, only Fiji and a few other islands remained intact.

When news of Pearl Harbor reached Melbourne, the immediate feeling among those working on the problem of the Japanese, at Army Headquarters, was one of annoyance at miscalculations. Imagination had balked at what appeared to be impossible, for, while attack upon what was one of the flanking bastions of our Pacific defense had always been included as a remote contingency in the many staff appreciations made in 1940-41, the consequence of such a venture had never been foreseen. We were prepared for the loss of Hong Kong; it was all too plain we *had* lost Indo-China, and would probably lose the oil fields at Miri in British North Borneo, but had some mystical flash of insight produced the fall of Singapore among the possibilities, the writer of this article would most certainly have been returned to regimental duty. In Australia, at any rate, we did not know that the big guns at Changi had only an arc of fire to seaward, nor did we realize until too late, that the island's water supply could be cut from the mainland.

It is as well to admit that there was

Map No. 1.

Australia and Its Approaches.

an awful lot we did not know, and blame for this must lie with those whose job it was to coordinate Empire defense. Intelligence was far too singular in its conception. Army headquarters in Melbourne possessed a steel filing cabinet full of news-cuttings concerning Japan, and for more up-to-date matter, relied very largely upon dispatches to the Prime Minister, or reports turned in by people who had visited the country. The Navy received better information from the Admiralty and could count upon the remarkably acute observations of mercantile marine personnel making the run to Japanese ports. Air Force intelligence was in its infancy, and until the beginning of 1941, there was no real collaboration between the three services, and none at all with the Americans or Dutch. As an example, it was not until General Brereton, commanding U.S. air units in the Philippines, visited the newly-

created Combined Operational Intelligence Center at AHQ in October 1941, that the number and composition of troops in the Philippines was known.

Until all doubt was past, it appeared as if no one was prepared to admit that the Japanese meant business. Diplomatic sources still spoke blandly about the "hotheads" in Tokyo or a "minority" movement in Bangkok, while by the same mail would come reports from the China coast, showing the grouping of forces in Hainan, Hai-Phong and finally Saigon that could have only one purpose. In spite of such evidence, almost the last bulletin from Singapore expressed the belief that their next move would be into Siam with the Kra Isthmus as its objective. That was dated a fortnight before the Japanese descent upon Khota-Bharu.

With the background that these notes suggest, it is scarcely to be wondered at that the Australian authorities were somewhat hesitant. With every effort directed towards the supply and reinforcement of the three divisions in the Middle East, the last thing wanted were operations nearer home. But, if Japan forced the issue, these were almost certain to take the form of attack upon that portion of the eastern seaboard lying between Newcastle and Sydney, where important industrial undertakings were situated.

Working on the figure of seven shiptons per man, it was estimated that Japan could transport and put ashore two divisions, with a third division held as floating reserve or based ashore in New Guinea or New Caledonia. This was fairly accurate as captured Japanese maps subsequently showed, and but for the overriding necessity for raw materials, something of the sort might have occurred much earlier. Among the major blunders of the Japanese was their failure to capitalize on opportunities presented by the success of the attack upon Pearl Harbor, or to exploit tactics of peaceful penetration in New Caledonia.

At the time of the Munich incident, there were 1,400 Japanese in New Caledonia. Most of them were working iron mining concessions about Goro on the northeast coast, but as individuals they were to be found in a number of other business undertakings. The French were quite alive to the implications of this unfortunate situation, and had increased the statutory period under which some 2,000 young men were passing through their military training. This was in the hands of a small cadre of French officers and NCOs, who gave a very good impression. In reserve were about as many men again, and had it not been for the obsolete nature of the equipment, the position would have been fairly good. But as happened elsewhere, the collapse of Metropolitan France altered everything; doubt and indecision shattered morale, and in general, senior officials in the Colony whose families remained in France declared for Vichy, and New Caledonia could have been had by anyone who made a gesture.

For a time, plot and counter-plot afforded an *opéra bouffe* atmosphere, which the New Caledonians themselves resolved at last with the moral support of an Australian cruiser. The captain of a French sloop made the traditional answer when invited to haul down his colors by HMAS *Adelaide*, and the upshot of it all was that she sailed away in the direction of Indo-China, to be followed in due course by the recalcitrant officials.

With that excitement died down. From her own slender store, Australia furnished a couple of 6-inch guns for the protection of Noumea, a few rifles to supplement those already on hand, and an AIF commando unit to carry on the training syllabus. Thereafter, due regard was paid to the resurgence of French national spirit, and what might have easily become an inconvenient portion of the fighting front

developed into an American base during the reconquest of the Solomons.

One other spot was seen to be of great significance in Australia's defensive schemes, and about it little or nothing was known. This was the island of Timor, lying 500 miles off the northwest coast. All that "Operations" knew about it in the middle of 1940 had been found by the writer in a Foreign Office pamphlet dated 1920, helped out by the elaborate production of an oil-prospecting syndicate that was registered in Shanghai. Between out-of-date figures concerning the export of minute quantities of rubber, etc., and glowing accounts designed to attract shareholders, the result carried small conviction to anyone. But it was obvious that the island was potentially dangerous, for, if the seizure of New Caledonia would disrupt Australia's sea-borne traffic in the Pacific, the loss of Timor would sever air communications with Singapore, and as the months slipped by, it became evident that the Japanese were thinking along these lines as well. In this they were helped by political considerations.

Timor is half Dutch and half Portuguese, and the first indication that Japan was casting eyes upon it came with an approach to the government of the former nation for permission to use the port of Koepang as a stopping-place in a new flying-boat service. The Dutch, whose native realism was reinforced by a long succession of Japanese subversive activities in the Netherlands East Indies declined the proposal, pointing out quite reasonably that the project had not the slightest commercial advantage. At the other end of the island the Portuguese proved more accommodating, and doubtless, with the ambiguous position of their holding Macao in mind, agreed to make the anchorage at Dili available. Here the Japanese lost no time in installing a maintenance staff and powerful wireless plant, and shortly after a Japanese consul arrived.

Australia countered these moves by arranging for the Qantas plane on the Singapore-Darwin run to make bi-weekly calls at Dili, and as a climax to lengthy correspondence between Canberra, London and Lisbon, the local Qantas agent was appointed His Majesty's consul. In all this we were a bad second, because lavish expenditure in the *Sociedade*, which then had an economic monopoly in Portuguese Timor, gave the Japanese a flying start, and until Dutch and Australian troops terminated diplomatic dickering by moving in, they had everything their own way in the northern portion of the island. As is now known, Ambon was captured at the end of January 1942, and Timor three weeks later. With the loss of these two places went 2,500 Australians, but when the stage seemed set for the actual invasion of Australia, the enemy contented himself with merely bombing Darwin and other northern towns.

The first half of 1942 was analogous to the post-Dunkirk period. Australia was certainly not alone, but everything had to be begun again, and until the return of the AIF from the Middle East, there was precious little to do it with. Manpower on the home front was short; trained troops were shorter still, and the equipment position was woeful. But we now knew where we stood, and no Jap had yet set foot upon Australian soil.

Hitherto, the national profit and loss account had shown very little on the credit side, and what few items existed were in the nature of concealed assets. One of these was the fact that the enemy had chosen to fight in New Guinea, where the very nature of the country played a large part in his eventual defeat. In spite of their success in Malaya, the Japs showed up badly as jungle fighters, and were not to be compared with the average Australian, whose natural bent found ample scope in the kind of warfare that ensued. The sketchy character of their

supply and medical services was as astonishing as their complete ignorance of field security. Every Japanese body that was searched provided valuable information in the shape of letters, diaries or regimental orders. One of their officers taken on Goodenough Island even carried an army list, a thing we had long been searching for. Apparently no thought of capture entered their heads, and only in the last year of the war did they learn from us the value of such precautions.

Japanese prisoners as a rule talked freely, the exception in the writer's own experience being a fighter pilot brought down on Melville Island after the first raid on Darwin. This was Prisoner No. 1, remembered now as one who pulled our legs in fine style. In those days we were all green, and the element of surprise achieved added greatly to their stature. Even when the impetus of their drive lost force, their suicidal bravery was worthy of respect, but apart from that, there was no question as to who was the better man.

It is not easy to explain the fighting in New Guinea and the Solomons without knowledge of the political conditions existing before the war. The Solomons were a British Protectorate, administered by the Colonial Office through the Governor of Fiji in his capacity of High Commissioner for the Western Pacific. New Guinea was divided between the British and the Dutch, the former section being split into Papua (Australian territory since 1906), and the old colony of German New Guinea, which had become a "C" class mandate under Australian control. As has already been indicated, there was no pre-war liaison between the Dutch and British portions, nor, what is more regrettable, between the Commonwealth and the Solomons. Beyond the fact that the Solomons were within the bounds of the Australian Naval Station and figured in the trade returns, they went about their own affairs, and there is little more that can be said about it.

We are all a great deal wiser now, but even in those days there was one factor that always complicated the defense of New Guinea. This was Article 5 of the mandate, which prohibited fortifications or the raising of armed forces other than police. There was no getting around this, and although it was suspected that the Japanese were busy turning such places as Truk in the Carolines and Jaluit in the Marshalls into bases long before they ceased to observe responsibility to the League in 1933, Australia fulfilled her obligations to the end—or nearly the end.

The old fort at Thursday Island, which for years had covered Torres Strait, was abandoned in the nineteen-twenties, and it was not until 1938 that plans to utilize Port Moresby as an advanced naval base were put into operation. This resulted in the installation of harbor defense works, fuel oil tanks and seaplane moorings. Discussions about that time regarding the amalgamation of Papua and the Mandated Territory carried with them implications of common defense, for it was anticipated that any Japanese attack would be directed in the first instance at the fine natural anchorage offered by Rabaul. Observance of the mandate clause blocked us then, but in April 1941 the position had grown so serious that, mandate or not, a battery of 6-inch guns was set up at the entrance to Rabaul, and a battalion of the AIF sent up to guard it. At the same time, enlistment in the New Guinea Volunteer Rifles provided every able-bodied civilian with an opportunity to bear arms.

That the Japanese were alive to the value of Rabaul was shown by the force of 20,000 they put ashore, after obliterating the fixed defenses in one devastating aerial attack. The undefended Solomons fell shortly after, and nothing remained between the enemy and Port Moresby but the Owen Stanley ranges on the mainland

of New Guinea. Their attempt to cross this barrier petered out within forty miles of the objective and the naval engagement in the Coral Sea put an end to Australia's danger. Thereafter things began to go our way.

In what must seem a catalogue of gloom, there were a few bright spots. In order of precedence, first place must be given to American aid. This was decisive. But the Australian Navy also gets full marks for the foresight with which its intelligence division had planned ahead. As a corollary to that preamble instructing sailors to "seek out and destroy" the enemy, the Royal Australian Navy had put down a chain of coastwatchers to help them do it. This stretched from the New Hebrides to the Dutch New Guinea border, and was composed of planters and local officials. Each of them was supplied with a two-way radio, and when invasion came, practically every man took to the bush and continued to report enemy movements. In some cases they remained there for years, hunted and harried, but conducting little wars of their own, and all the time providing information of the greatest value.

The natives themselves solved any doubt about their use in war by proving very useful indeed when led by officers who understood them. There were no better jungle fighters than the Fijians. Even the primitive natives of New Guinea enjoyed what was only head-hunting on a larger scale, and instead of adorning their huts with a choice collection of skulls, soon learned to profit by the reward of meat and rice offered for each Jap brought in alive. This sort of thing became rather a racket as time went on, for the natives began to keep their prisoners penned up like pigs, producing one every now and again when they felt that white man's "kai kai" would improve the village diet. In more orthodox fashion, the native battalion, which grew out of the Papuan Armed Constabulary, finished with a strength of 5,000, while the work performed by natives of all kinds as carriers throughout the war made all the difference to operations in areas where wheeled transport was impossible.

In what can only be points picked out at random, it was the magnitude of Allied equipment that paralyzed the Japanese. But the machine is only as good as the driver, and behind it all was a feeling of superiority which steadily increased as we took the measure of the enemy. Based upon poor intelligence and bolstered by an unbroken succession of victories, we found eventually that the Japanese Army had been rated much above its true form. Their own arrogance in conquered lands lost them the regard a strong man always gets; their inhuman cruelty edged wrath with vengeance, but what really won the day was the knowledge that those who manned our Pacific front were better in themselves. This lesson will not be forgotten.

It is necessary that every superior commander give proof of his capacity for judgment, of his foresightedness, and even of his spirit of decision. This is of much greater importance than is thought by those without experience, and it is necessary that, in the maneuvers of large units in time of peace this be exploited to the limit.

A Defesa Nacional (Brazil)

The French Doctrine of War and the Campaign of 1940

Translated and digested at the Command and Staff College from a Portuguese article by Major Heitor A. Herrera in "A Defesa Nacional" (Brazil) August 1944.

PERFECTION of armament, and the development of the matériel used in battle, have always decided, down through the centuries, the fate of the forces engaged in warfare. Though other factors have also played a part in determining the degree of success achieved by the great military leaders, the first mentioned ones have always been dominant.

The initial success of Nazi Germany, the vigorous reaction of the Soviet Republics, the capacity of resistance of England, the phenomenal mobilization for war of the United States—all these allow the conclusion that, in spite of any superiority enjoyed by one form of government over another, it has, in each instance, been industrial superiority that was responsible for success.

If, however, this superiority has always played a decisive role, how does it explain the fact that a nation like France, spurred on by the uncomfortable proximity of a revengeful rival, should carry her unpardonable blindness to the point of permitting the enemy's cultural aspirations to culminate in the spectacular victories of a *blitzkrieg*? How did the successors of Napoleon fall asleep in the shade of the Maginot Line, with a concept of war which was to lead them to the disaster which astounded the rest of the world?

Intellectual Aspect

Disregarding, for the moment, the decisive role which superiority of matériel played in the initial success of the Germans, let us study a little more closely the intellectual aspect of the problem.

When we examine the principal campaigns of World War II, we quickly perceive the application, *in toto* of the principles which, since the time of Napoleon, have constituted the framework of the French doctrine. But new means and new methods have arisen, from the use of propaganda to undermine the morale of the enemy, to the rapid maneuvers by parachute forces, armor, and aviation which thus add a new element to the principles of surprise and opportunity for action.

Such a line of reasoning leads to the conclusion that the French doctrine of war, based on such proved truths, should have modified its methods of operation to conform to the accelerated tempo that new weapons impose on the conduct of operations.

Careful study of the French regulations and French military writers reveals a certain lethargy in the application of principles, a prudence, frequently exaggerated, in the carrying out of instructions, and even inactivity in the face of avowed inferiority of matériel. This occurred even among the most esteemed military authorities.

The reason for an inferiority complex of this sort is, perhaps, to be found in the objectivity which dominated the French military studies. The long-standing Franco-German rivalry, the constant threat on France's eastern frontier, which menaced her hour by hour—all this, as she painfully constructed the Maginot Line, imparted to the texts of her regulations the admission of the latent power of her certain enemy and her own weakness. This, therefore, is the cause of that prudence, of that concern for security which impelled France to create obstacles, and which finds its way, even into the chapters of her military texts dealing with offensive action.

It can, therefore, be concluded that the dominating ideas were essentially defensive. In other words, that the matériel

superiority of the probable enemy brought about a mania for the warding off of his blows in place of raining blows upon him. It created the penchant for a systematic search for obstacles, for retaining them, and for deriving from them whatever advantages they might offer.

All that complex sequence—approach march, establishment of contact, engagement and attack—which makes offensive combat the most difficult form of tactical operation, was relegated to the costly assembly of forces back of the Maginot Line. Any attack would have to be a frontal breakthrough attempt. The initial work of cavalry, thrust out ahead in reconnaissance operations; the role played by the advance guard in the difficult march against an enemy concerning whose nature and position but little is known; the action of the commander deploying his forces with the aim of seizing the initiative; the whole of this operation in which intellectual superiority plays a leading role, and martial virtues are at the highest premium, found little opportunity for expression in France's idea of stabilized warfare. The dynamic aspect became expressionless since enveloping maneuvers had been cast aside because there were no flanks.

An example of French military thought which appeared to be fitting, is to be found in the theory of relationship, which the experiences of *positional* warfare fully confirmed: "The depth of an attack is limited to a distance which is practically equal to half the width of the front that is being attacked." This was the reason for those famous, semicircular pockets that were so common in World War I.

That this relationship was true for the means of that time is undeniable. Also, there was a time when the approach march began when the enemy came into sight, since the action could not be begun from greater distances away. Later, artillery extended the initial limit of this phase to five kilometers, which was then augmented progressively until aviation violently destroyed the classical notion of security, and restricted troop movements in the communication zone during all phases of the struggle.

Evolution of other military thought appears to have been similar to the classical relationship between breadth of front and depth of attack, which once again would confirm the inanity of formulae in so complex a science as war. Before the advent of mechanization, attacks were supported exclusively from fixed bases where the fire power was deployed. But the advance of the attack echelon led to a critical phase where the range of the artillery had reached its limit and a change of position was necessary, with the consequent lessening of the protection the artillery had been providing. It was necessary, then, to establish a new base of fire before the attack could be resumed. Because the attacker was bound to a stationary base, the flanks of the attack echelon, as it progressed became more and more exposed so that attacks were launched with fixed limits. But times changed and speed began to rule, as in the time of Napoleon's famous exploits. It was necessary, therefore, that the supporting fires should be continued, with the same intensity, for the support and protection of the attack echelon. So, at the present time, we find the cannon and the machine guns rolling along with the armored vehicles, themselves confirming the old aphorism: "Attack is advancing fire."

The French, in 1940, refused to accept the need of a change in their doctrine. At nightfall of 13 May, the Nazi bridgehead on the Meuse was ten kilometers deep, having reached Mézières. Imminent, irremediable defeat was ahead, but on the afternoon of the 14th, the Supreme Allied Council in session at Paris, heard from its experts the comforting information, "The German pocket cannot be extended much more since, with the Maginot

Line on one side and the Namur works on the other, and both firmly holding, the attack is strangled with respect to width. It is reduced to a width of fifty miles. . ."

The result passed into history under the name of "Dunkirk," that tranquil seaport some 300 kilometers from the Maginot Line, before the month of May was over.

Conclusion

When the initial stupefaction had passed, and the elements which had guided the action of the formidable Nazi machine had been studied, the conviction was intensified that all could be summed up in the methodical application of the old principles which had been codified by Napoleon more than a century before on all the European fields of battle.

Today, as in the past, speed is supreme, and the principle of surprise remains unalterable. The principle of concentration of force has been reaffirmed in all respects, and after the reaffirmation of all the others, from the principle of security to that of economy of forces, we also find the last and the most vital one of all reaffirmed: "Only offensive action can lead to victory."

The Future of the Armored Division

Digested at the Command and Staff College from an article by Captain R. J. Sutherland in the "Army Quarterly" (Great Britain) October 1946.

WHEN the first atomic bomb dropped on Hiroshima on 6 August 1945, many soldiers felt, momentarily at least, that war had become intolerably destructive and that armies of the traditional sort must ultimately disappear. Unfortunately the last year has made it only too apparent that war has become more terrible without becoming any the less likely. Our program for peace must rest, for the time being at any rate, upon the intelligent recognition of force. The British Army must bear perhaps even greater responsibilities in the future, notwithstanding the atom bomb or other hardly less devastating weapons, such as bacterial warfare, which science seems bound to inflict upon us. It is obvious, however, that future wars will be drastically different from the last one, and we must examine our strategy in the light of these changes. In this, the second year A.B. (After the Bomb), it is altogether proper that we should critically consider the future of armor.

There is an element of poetic justice in the fact that the Armored Corps, who were the military prima donnas of World War II, seem to be groping into the future with the smallest share of confidence. The infantryman is certain that no matter how war is waged the largest share of the fighting will be his. The gunner can face the prospect of rockets instead of guns, confident that though the heavens may fall, Larkhill will remain Larkhill. But the armored Corps, which is perhaps the most progressively minded, has, in general, continued mentally to fight the Germans and the Japanese. There is accordingly, a considerable feeling that another war might find the armor just one war too late. It is no criticism of the military mind to say that it operates in a rut, because this is a necessary feature of war and of training for war; but the time may have arrived to choose another rut. In particular we may raise these questions:

1. Will the army of the future be com-

pletely airborne, and does this mean that any equipment not suitable for air transport should be discarded?

2. Should we retain the armored division or should we restrict ourselves to infantry divisions supported by armored brigades?

3. Assuming we are going to retain the armored division, what changes should be made in its organization?

In this last connection it is well to remember that the present organization was evolved with much lighter tanks and guns, and before the introduction of the bazooka, the flame-throwing tank, the armored personnel carrier, or rocket projectiles. These new weapons have been added to, rather than integrated into, the tactical team.

Our first question is largely rhetorical and worthy of serious attention mainly because of the excessive gullibility of some journalists and politicians. Already the Canadian Minister of Defense has laid marked emphasis on the magical word "airborne," without apparently realizing the limitations to which such forces are subject. Although we had marked air superiority at Arnhem, this battle proved conclusively that airborne troops must be speedily supported by ground action. In Burma, it is true, a whole campaign transported and supplied by air was almost miraculously successful; but it must be recognized that this operation of war was waged in an area peculiarly unfavorable for motor vehicles and against an enemy notably weak in armor. At the present time we can land light tanks from the air, but these are almost helpless against heavy armor. We could probably build an aircraft capable of transporting a thirty-ton tank, but this would require a very large and carefully prepared airfield. To transport any number of such tanks by air would appear at the present time a highly speculative proposal, while the thirty-ton machine has already been rendered obsolete by much heavier ones. It appears, therefore, that in the predictable future, airborne troops will continue to be highly vulnerable, particularly to heavy armor. We must conclude that airborne troops are destined to play a major role, but that they must be supported by powerful and energetic ground action. This will continue to be the case either until means can be found of landing heavy tanks in considerable numbers from the air, or until a new weapon or combination of weapons succeeds in neutralizing the tank. Neither of these appears an immediate probability.

The achievements of infantry divisions supported by tank brigades were so spectacular as to raise the question whether armored divisions are necessary at all. The elimination of the armored division would cure the army's split personality or armored-versus-infantry conflict as well as simplifying both organization and training. As the war progressed, the distinction between the roles of infantry and armored divisions became more and more nebulous, which suggests that a single organization may now be in order.

But it must be admitted that in army ways the problems of war are less difficult than the problems of peace. Standards of training and leadership are, if not higher, at least more realistic and problems are easier to solve because they are more clearly seen. With this thought in mind, it is contended that if battles are to be fought at tank rather than at infantry speed, we must continue to have specially equipped, and even more important, specially trained armored divisions. For the Territorial Army this is even more important than for the Regular Army. On the other hand, there is much ground over which tanks and other vehicles cannot operate, and we shall still require infantry divisions. As a general policy, it is suggested that the army should consist of airborne, infantry and

armored divisions. All infantry divisions, less a residue of transport, should be air transportable, but armored brigades should be retained to support infantry divisions where this is possible.

Organization

In approaching the problem of organization it is well to observe that there has never been a perfect war establishment—and if there were it would no doubt speedily be amended. Organization depends not only upon new weapons, but also upon the theater, the enemy, and the personality of the commander. It should be accepted that the "normal" organization evolved in peace will have to be amended to meet the abnormal demands of war. The study of military organization is, therefore, something like the study of philosophy; the results are never conclusive, but the exercise is usually beneficial.

With these limitations in mind the following organization is suggested for an Armored Division:

Divisional headquarters and headquarters squadron.

Reconnaissance regiment: consisting of four squadrons equipped with light tanks and armored cars.

Armored brigade: headquarters; engineer squadron (bridge layers, armored bulldozers, etc.); four armored regiments (one troop per squadron to be equipped with flame-throwers).

One self-propelled antitank regiment: headquarters and four squadrons.

Two infantry brigades (each): headquarters; machine-gun company; three infantry battalions; with attached: one personnel carrier squadron; one towed antitank battery.

Artillery: headquarters; one rocket regiment; two field regiments; one self-propelled heavy regiment; one antiaircraft regiment.

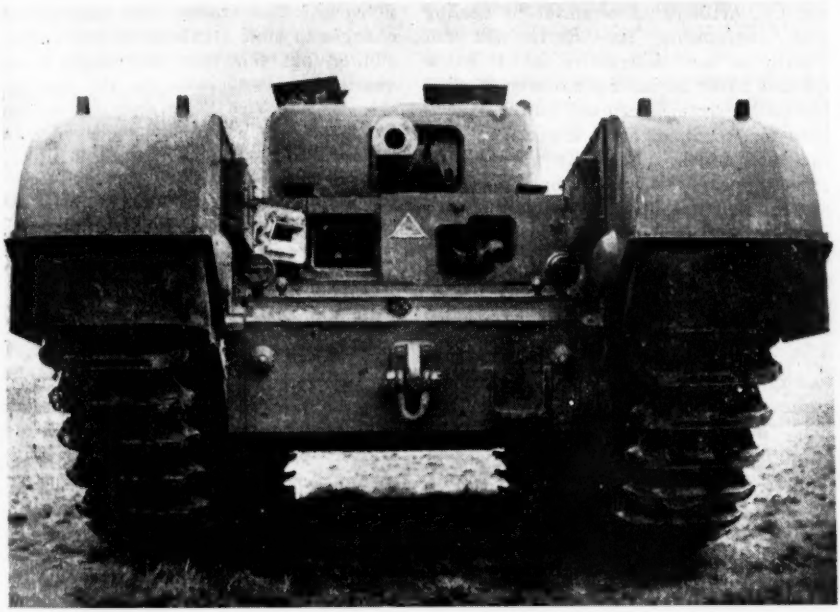
Engineers headquarters; field park company; three field companies.

Divisional Signals, Army Service Corps, Royal Electrical and Mechanical Engineers.

This suggested organization shows the division considerably increased—actually by about one-quarter. The object of this is to increase the endurance of the division by permitting units and brigade headquarters to be given frequent short rests. This matter of fatigue among junior commanders and staffs is much more important than is sometimes realized. There is a tendency to submerge its effect, since no commander could either plead or accept it as an excuse for failure, yet the matter deserves systematic consideration as a factor in war. It is true that some men are almost indifferent to it, but the average man is not—and it is with average men that wars must be fought.

A relief within a division, if carefully planned, causes very little delay, but a divisional relief in country which is at all close is extremely time-consuming. The actual loss would be very hard to assess in any given case, but considering the "strangeness" of the incoming division it would probably amount to at least one day's respite to the enemy. It is suggested that these two factors—overfatigue, particulary on the part of junior leaders, and time lost in the course of reliefs—may furnish the clue to many battles which started promisingly but bogged down prematurely. The argument for a somewhat larger armored division is, therefore, that by making possible more frequent unit reliefs, divisional reliefs will be less necessary. Operations should move faster and there should be an over-all saving in manpower in terms of fighting power.

The proposed organization is not particularly radical, and is in fact nearly the organization of the 7th Armored Division during its advance to Bremen, when it had a second infantry brigade and an



Outmoded for the future?
A late model British tank.

armored car regiment under command. The increase in infantry is the most important feature. During the war very heavy demands were usually made on the infantry in the armored division, and the division was frequently crippled because the infantry was too tired or too disorganized to carry out the tasks imposed on it. The bazooka means that tanks must always operate in closest cooperation with infantry, and in the future even heavier demands will be made. Each brigade has attached one squadron of armored personnel carriers, made up of four troops each able to carry a company. The alternative to this scheme is to give each battalion its own carriers, but expense, as well as the need to keep vehicle numbers within reasonable limits, would probably preclude this. Almost any form of turretless tank or heavy carrier should prove an acceptable vehicle.

The motor battalion has been eliminated from the armored brigade because it is felt that the armored personnel carrier has made it obsolete. On the other hand, it is realized that motor battalions were a most important factor in making possible the successes of armored divisions. The aim should be six motor battalions instead of one. It might be good propaganda to designate all infantry in armored division as "armored infantry" in order to emphasize the need for speed and offensive action.

The organization suggested for the ar-

tillery is rather speculative. During the pursuit, artillery is essential in dealing with rearguards. Its efforts will not usually be very destructive, but it has a distinct effect on the morale even of good troops. Extreme accuracy can be sacrificed for weight of fire and speed in coming into action. For this purpose the rocket appears ideal; it not only furnishes a great weight of fire, but delivers it with devastating sound effects. However, the rocket is not as yet sufficiently accurate for support of infantry or for destructive fire. Two field regiments are therefore suggested. In addition, a gun is required with greater destructive power than the twenty-five pounder and with extreme accuracy for dealing with pill-boxes and the like. The tentative suggestion is made of an eight-inch howitzer on a self-propelled mount. Antiaircraft defense, which was allowed to decline in the closing years of the war, should be energetically revived, not only by the antiaircraft regiment, but in all units of the division. Towed antitank guns are shown attached to infantry brigades, with which they will normally fight, and are therefore grouped.

It is contended that the self-propelled antitank regiment should belong to the armored corps rather than to the artillery. The motto of the self-propelled guns—"a gun, not a tank"—has sometimes been allowed to conceal the fact that the self-propelled gun is an armored fighting vehicle, and should be fought as one. In the writer's observation, officers of self-propelled units were unable to follow the battle over the air or to receive and obey wireless orders. Their mental processes were apparently geared too slowly for the armored battle. Armored fighting vehicles are the concern of the Royal Armored Corps, and should be manned by them.

The three brigade headquarters should be identically organized and each able to control infantry, armor, or more probably both. In order to do this, a very "tight" tactical doctrine is necessary within the division. This raises the question of changes in staff organization and responsibility, but this is a very much larger question.

Tank Policy

Another problem is tank policy—whether super-heavy tanks should be built, and, if so, whether they should be included in the armored division. However, it is felt that some or all heavy tanks could be incorporated into the division without major changes in organization. The reconnaissance regiment is a problem by itself, but there can be no question but that the division requires one.

Perhaps at no time has the immediate military future appeared less predictable. Military prophecy is a hazardous venture at any time, but at present it seems little short of folly. It appears, however, that the atom bomb constitutes a major threat to the bases and to the industrial capacity upon which the army depends, but that it would be wasted on the actual battlefield. The effect of the bomb on tactics, seems, therefore, to be less than might at first have been thought. The increasing power and decisiveness of air bombing, to which the atom bomb and the rocket projectile are notable additions, has however, materially affected strategy. More and more the probable strategic role of the army will be the protection of our own air bases and the attack upon those of the enemy. But decisive victory, which is a political concept, still requires, almost by definition, that the army should occupy, or at least control, the enemy territory. In an important sense this may only symbolize the victory which will have been won by airpower, but even the possession of overwhelming air superiority does not guarantee that this occupation will be carried out without hard fighting. Airborne troops will no doubt be used in large numbers, but it is contended that these

troops will, in all probability, have to be supported by an attack "on the floor" for which armored divisions are still, and it is felt will continue to be, the natural instrument. On the other hand, for defense against this sort of airborne attack, armored divisions will be indispensable. We already have airborne tanks and in the future, no doubt, the Royal Armored Corps will devote increasing effort towards developing such equipment. But for the immediate predictable future, the armored division must remain an essential part of the strategic team, just as the tank must remain an essential member of the tactical team.

Russia's Fighting Methods and Ability as Seen by the German Wehrmacht

Translated and digested at the Command and Staff College from a German article by Lieutenant Colonel M. Waibel in "Allgemeine Schweitzerische Militärzeitung" (Switzerland) January 1946.

DID the German Wehrmacht underestimate its Russian adversary before the outbreak of the war? Interesting light is shed on this subject by a secret German leaflet relative to the peculiarities of Russian methods of fighting. This leaflet was issued by the Army High Command, Eastern Friendly Army Section, on 21 June 1941. It was reproduced for distribution as far down as the platoon, and was supposed to give the German troops a picture of the methods of fighting employed by their Russian adversary.

Characteristic of this picture is the fact that the combat worth of the Russian soldier is very highly estimated, a thing which is quite worthy of note when it is recalled how strenuous was the effort made by the official propaganda organizations of the Reich to belittle the worth of this soldier. But, on the other hand, the Russian Command was not highly esteemed by the Germans, and mental inertia and dislike of responsibility were expected of it.

It is obvious that the Germans failed to recognize the fact that military leaders who spring from the ranks of the people develop much more rapidly than fast and hard doctrine is willing to have it. They should have known from history, that in revolutionary armies particularly, war creates great leaders in a very short period of time who, in their turn, impart their own stamp on war. Had not Napoleon and his marshals handed down many proofs of this?

But, apparently, there did not exist, on the part of the leading members of the German command, any doubt that they would succeed in quickly defeating Russia, and that they had to deal with anything more than the Russian armed forces of 1941. Nor did they have any doubts that the Russians were utterly incapable of increasing their fighting strength.

Chief of the Reich Press, Dietrich, formulated this fixed idea most clearly when, in October of 1941, three months after the beginning of hostilities, he artlessly made known to the German public a report from the Fuehrer's headquarters that: "The campaign in the East is ended!"

The text of the "Leaflet Concerning the Peculiarities of the Russian Methods of Fighting" follows.

Leadership and Tactics

Since Russian views relative to leadership and tactics are similar to our own, only those points where differences exist

will be mentioned in this leaflet. It is, however, to be borne in mind that the principles set forth in the Russian regulations are not universally observed, and have not as yet been universally assimilated by command and troops.

Destruction of the enemy appears, always, to be the aim of the Red Army's combat operations. The main aim of every combat operation, attack as well as defense, is to inflict a crushing defeat on the enemy. But, only attack with concentration of means at the point of main effort can lead to complete annihilation. In the foreground, therefore, stands war of movement aimed at the flanks and rear of the enemy.

Methods of Fighting

Attack is strongly emphasized and is of the massed type conducted in several waves which follow closely upon one another, usually with an artillery preparation lasting for hours and always supported by tanks, even in the case of the smallest formations. For better artillery support, frequently individual guns (even guns from the divisional artillery) are placed at the disposal of the attacking companies and, on the march, at the disposal of the advance party. If unsuccessful, an attack is repeated and, if necessary, is followed by a rapid succession of infantry attacks in massed order.

Constantly, even in the smallest actions every opportunity that is offered for outflanking, for envelopment, for attacks against flank and rear, yet never without holding the enemy in the front, is taken advantage of.

Defense is conducted in manners similar to those employed by the German Army. Strong groups of shock forces for use in counterattacks are held in reserve. The greatest value is attached to unbroken antitank defense and a deep obstacle zone ahead of the combat outposts. It is usually organized in the form of several successive lines. In the construction of positions, the Russian is a past master. As far as latest observations show, the emphasis on depth of position found in the Russian manuals, is, as a rule, disregarded.

In consequence of the great sensitiveness of the Russian flank, great attention is given to junction with adjoining units and to flank and rear protection.

Penetrations, if they occur, are answered by means of immediate counterattacks which, however, as shown in the Finnish-Russian war, may be successfully broken up by means of artillery fire.

The Russian soldiers are trained in the establishment of ambushes and in trickery, even in time of peace. In all methods of fighting, use is made of dummy installations, and a deceptive fire with all weapons. The killing of wounded must be expected, and likewise the Russian trick of make-believe tank trouble in order to be able to fire on their approaching enemy at very close range. As would be taken for granted, weak forces (infantry advance parties, etc.) are allowed to pass in order to fall on the main body which is following.

Particular value is also attached to the employment of ruses in reconnaissance, for attracting fire, by the use of dummy figures, for example, or the remote manipulation of noise producing apparatus in the enemy's wire obstacles, etc. Their inventive genius in such matters is very great.

Action is carried on in the rear of their enemy by means of parachute forces, sabotage groups, and agents, for the support of military combat operations and for purposes of political influence. But also action by small detachments which filter through gaps in the front and attack isolated individuals as well as small detachments can, with certainty, be expected. The latter will be the case, particularly in winter, when such operations will be conducted by means of ski patrols.

Types of Arms

The *infantry* is accustomed to long marches (sixty to seventy kilometers) with heavy packs. They are trained in night attacks with limited objectives with formations of up to a battalion in strength and, exceptionally, with a strength of up to a regiment or a division. Special emphasis is placed on marksmanship training and there are many snipers. During every lull in battle and after every gain of ground, the Russian infantry quickly dig themselves in, thus preventing counter-attacks from being effective.

Great importance is attached to winter training, with special reference to mastery of the use of snowshoes and living under field conditions in very cold weather and deep snow.

Cavalry, in the large formations, is trained for operational employment along with motorized and mechanized forces. This sort of employment will doubtless be attempted, although in view of the Russion conditions, difficulties should arise from the point of view of command.

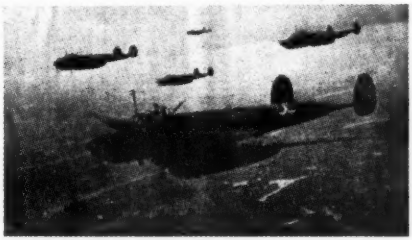
Reconnaissance is constantly carried out with the use of cavalry in cooperation with armored scout cars and motorized infantry in accordance with principles similar to our own. These cavalry forces still engage in attack operations, although the Russian Command recognizes the impracticability of them.

We must expect surprise attacks on isolated columns especially at night, conducted by mobile forces which conceal themselves during the day in the extensive forests.

The *artillery* attempts to compensate for lack of skill in command and fire tactics by massed fire of long duration. It is drilled in the unconditional support of the attack infantry and will not, therefore, hesitate to go into action, even with isolated guns in open positions.

Engineers are employed in the construction of positions, in organization of the ground, in obstacle construction service, and in bridge construction, and are, without any question, good in these purely technical service branches.

The *armored forces* are employed in the support of the attack infantry, working in the closest cooperation with it. Armored combat vehicles are employed in every combat operation. The experiences of the Finnish-Russian war showed that tanks even took over the task of providing protection for the infantry while the latter was digging in on a newly seized line, and that tanks are used as prime movers for towing sleds with protective shields and loaded with infantry into the enemy positions. In defense, tanks were dug in, and in this way, frequently gave the impression of permanent combat installations with armored turrets.



Russian planes—technically good.

In addition to this, armor is also used in large formations in an operational manner, in the same way as in the case of large cavalry formations. We may also expect difficulties here with respect to command.

In view of the existence of amphibious tanks in great numbers, it must be borne in mind that water courses alone, are not to be considered as tank obstacles. The performance of these tanks in water is not known.

Further, the Russians possess tanks with flame throwers, and other chemical warfare agents.

A Russian tank.

We must be prepared at all times for the employment of *chemical weapons* in every form, although the Russian regulations deny any intentions of using them as long as their adversaries do not begin their use. We must be on guard against persistent chemical warfare agents in connection with the effort to create obstacles of every sort. Experiments with the view to the employment of hydrocyanic acid as a chemical warfare agent are in progress. Their results are unknown.

Air forces will very often intervene in ground action, even in the case of small operations. Their performance is good from the technical standpoint but they will, however, not be able to operate with full effectiveness, due to difficulties in the way of command and organization.

Capabilities and Personality

In accordance with the character of the Russian people, there everywhere prevails a mental slowness and a leaning

for the schematic, as well as the dislike of responsibility and an inability to make decisions. There will be very few of their leaders who will be exceptions in these respects and able to free themselves from dependence on regulations. This mental slowness sometimes reaches the point of stupidity and creates the greatest of hardships. Very heavy losses are borne without hesitation. If the entire first attack wave is annihilated, the second, and the third, with no hesitation, sometimes driven forward by their own fire, take its place.

In the Russian-Finnish war, it was learned that the Russian soldier fights without enthusiasm or energy. In fighting for his homeland the idea of protection of the Fatherland will cause him to fight hard.

All things considered, the Russian is better in defense than in attack. In defense he is resolute and brave, and usually prefers death to retreat. He is staunchly loyal to his commander.

Terrain

The *terrain* receives its character from its enormous expanse. The western part of Russia is similar to Poland, having great partially hilly plains. The mobility, especially of motorized forces, suffers as a result of the great marshy regions, and, as throughout the whole of the Russian terrain, of the wholly inadequate and poor road network, as well as the numerous water barriers with few bridges.

Summary

The strength of the Russian military organization is based on the mass of its personnel and equipment of all kinds, on the simplicity, hardness, and bravery of the human material, as well as on the vastness of the area.

Its weakness resides, above all else, in its, as yet, incomplete training, in mental slowness, and dislike of responsibility on the part of its leaders, and serious lack of organization.

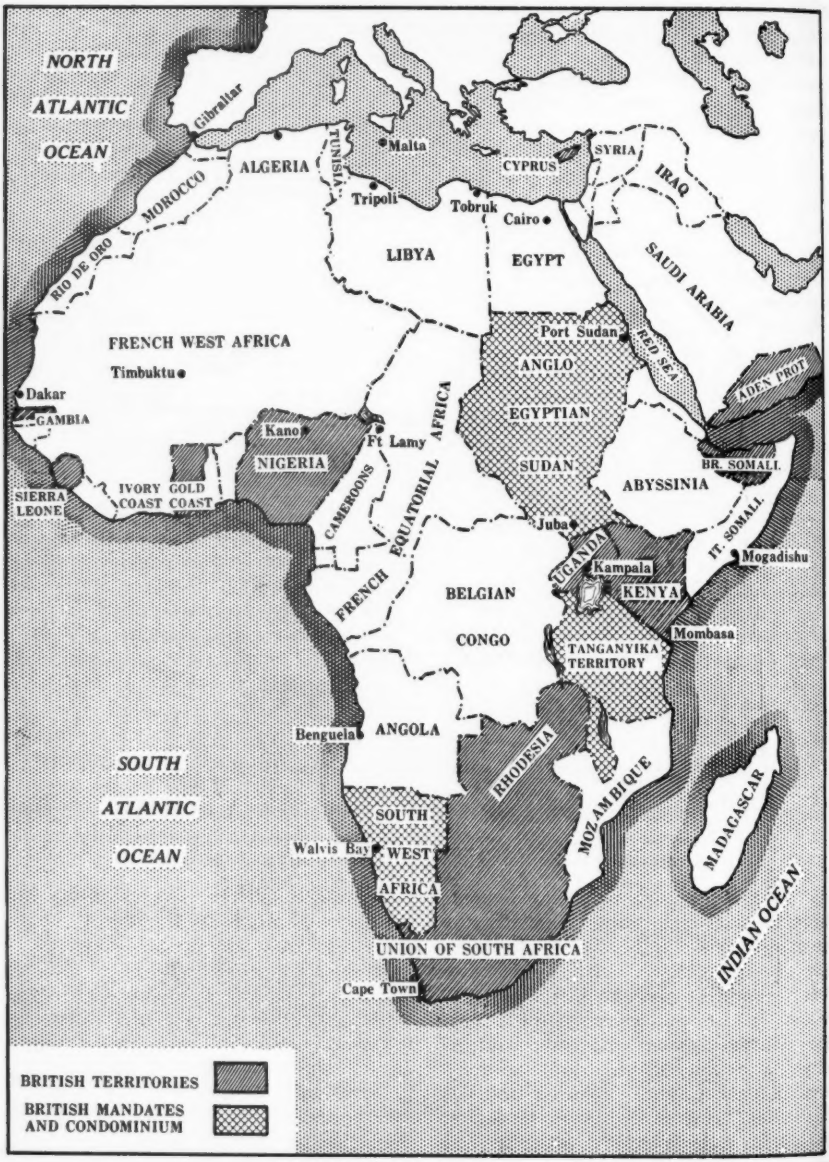
The army is, as yet, not an efficient combat instrument. It will be forced to succumb, when opposed by a modern adversary whose command is capable of the rapid execution of far-reaching operations. But the Russian soldier will fight hard in the defense of his home.

The Future of British Africa in Relation to Commonwealth Strategy

Digested at the Command and Staff College from an article by Brigadier G. S. Brunskill in the "Army Quarterly" (Great Britain) October 1946.

AT last the British public, as well as our statesmen and military chiefs, are becoming increasingly alive to the fact that we must face our strategical needs. It is becoming more and more apparent that a British Commonwealth which is strong both commercially and strategically, is a paramount necessity to secure a peaceful existence for ourselves and for the world. There is no doubt, therefore, that we must think in terms of strategical defense in rebuilding our Commonwealth until we are quite sure we can scrap our defenses and rely on world security under a United Nations Organization.

Such strategy must be based largely on the new "explosive" atomic energy. Already the scientists, the tacticians and the strategists of all nations are thinking out countermeasures; it is reasonable to suppose that means of defense and counterattack will be found, in exactly the same way as they always have been to inventions such as gunpowder, armor,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Gibraltar
ALGERIA
TUNISIA
Malta
CYPRUS
SYRIA
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Cairo
LIBYA
EGYPT
SAUDI ARABIA
RIO DE ORO
FRENCH WEST AFRICA
Timbuktu
Port Sudan
RED SEA
ANGLO EGYPTIAN SUDAN
ADEN PROT
Dakar
GAMBIA
Kano
NIGERIA
Ft Lamy
FRENCH EQUATORIAL AFRICA
BR. SOMALI
ABYSSINIA
SIERRA LEONE
IVORY COAST
GOLD COAST
CAMEROONS
Juba
UGANDA
Kampala
FT. SOMALI
Mogadishu
FRENCH
BELGIAN CONGO
KENYA
Mombasa
TANGANYIKA TERRITORY
Benguela
ANGOLA
RHODESIA
SOUTH ATLANTIC OCEAN
SOUTH WEST AFRICA
Walvis Bay
MOZAMBIQUE
MADAGASCAR
INDIAN OCEAN
UNION OF SOUTH AFRICA
Cape Town
BRITISH TERRITORIES
BRITISH MANDATES AND CONDOMINIUM

submarines, tanks and air bombs in the past.

Admittedly anti-atom strategical thought is in its infancy, but already there are several deductions which can be made; in fact some of these have already been made by other nations.

The Russians have long realized that today greater depth of defense is required than ever before. It is natural that they should react in this way, because it was the redistribution of their heavy industry in depth, on a ten-year plan, in anticipation of World War II which saved their country from being overrun and the world from Fascist domination.

Outposts are required to deflect or destroy atomic attacks before they can penetrate to vital centers. Behind the outposts, great depth is required in which to disperse national resources and to organize counterattacks. And in this connection it must be realized that the basic needs in development of national strength in modern total war are:

(1) immediate nucleus of forces and reserves;

(2) warlike equipment; and

(3) military manpower.

That is the order of their importance. For example, conscription which gives every man (and woman too) a rudimentary military training is useless if warlike equipment and stores cannot be produced in time for them to use them.

It is therefore imperative in rebuilding, and then in enormously developing, our Commonwealth resources and standards, that we think in terms of outposts, depth, dispersion and industrial development.

In the last two world wars the United Kingdom has been the principal Commonwealth base, but it is extremely doubtful whether such a restricted island territory can ever again successfully fulfil this role.

Atomic depth charges may counter the submarine menace to the United Kingdom, but we have no outposts or depth in our own territory for protection of these islands against modern air attack or atomic rockets.

If this is accepted we must consider where else in the Commonwealth are there the outposts and depth, as well as the resources and manpower, to form the main "base" for modern war.

At the worst stages of the last war, when there was a prospect of the United Kingdom being overrun by the enemy, the establishment of the main Commonwealth base in Canada was contemplated as a last resort. Canada (with Arctic outposts), Australia (if more densely populated), and also New Zealand, might well make themselves comparatively secure against attack provided that the U.S.A. was an ally or friendly neutral. But strategy based on these territories could be only in the nature of local passive defense. They are too isolated from the rest of the Commonwealth and too far from potential enemies in Europe and Asia for purposes of counterattack. The British Commonwealth could certainly not be preserved from a main base in any of these countries.

There remains Africa, and it is immediately apparent that the loss of Africa would lead inevitably to the dismemberment of the Commonwealth and the destruction of British strength. In territories in Africa which are either British, or to a great extent British spheres of influence, we have the necessary strategical position for a Commonwealth base.

In Aden, British Somaliland, Cyprus, Malta, Gibraltar, West Africa, St. Helena, Ascension, Mauritius, the Seychelles, etc., we have potential outposts of our own.

In addition, we shall retain a garrison in Palestine for some time to come, we have a right to locate forces in Trans-Jordan, we shall presumably have power of re-entry to Egypt in the event of war,

and the Arab League as a whole is pro-British by tradition.

Behind these outposts is a continuous British belt 4,000 miles in depth, and nowhere less than 1,000 miles in width. This belt comprises the Sudan (a condominium it is true), Uganda, Kenya, Tanganyika (which may become a UNO trusteeship), the Rhodesias, various Protectorates, and last, but greatest, the Union of South Africa.

Moreover, British Africa is so situated in the world that a counteroffensive could be launched from it against any other world power, or potential world power, except in the Americas. On the other hand, its southern extremity is isolated from the rest of the world and comparatively immune from danger of attack unless we lose command both of sea and air in that region.

In ninety-nine per cent of these vast British Commonwealth territories in Africa we have a teeming colored population which is ever increasing and has a low standard of living which must be raised. The only way to do this is by the creation of industries on the lines so strongly advocated by Lord Wavell for India.

In these British Africa territories considerable resources are already known to exist and it is highly probable that nearly all the raw materials required in modern war can be found there. Oil and coal are at present scarce, but the enormous water power available and the development of atomic energy may well reduce our needs in these commodities.

Surely, therefore, long-term planning for the development of British Africa as a whole must be put in hand at once, for the betterment of the backward peoples, for the re-establishment of British commercial strength, and for strategical protection in case world peace does not materialize so idealogically as we hope.

The first step should be coordination in planning on the big questions which affect our African possessions as a whole. The necessity for this has been conclusively proved by the opening stages of the conferences with the Egyptian Government, at which the complete withdrawal of British troops from Egypt has been announced, to the surprise of the Union of South Africa. These conferences are also proving how much British Africa is linked to the Middle East from a strategical point of view. Moreover, our strategical planning is already veering towards setting up regional staffs of the combined services together with the Dominions. In Africa this coordination should be achieved by periodical Pan-African Conferences. The present development of regional coordination in East, West and Central Africa respectively, is good but totally inadequate by itself. Primarily, these All-African Conferences should be on a purely British basis, but on occasions the other nations with territory in Africa, all of whom are our natural allies, should be invited to take part. In Whitehall we should set up an Africa Office to replace the present tangle under which the Foreign Office, the Colonial Office and the Dominions Office, each have direct responsibilities for the various territories in Africa and the Middle East outposts. A Secretary of State for African Affairs should preside at the suggested All-African Conference in Africa. A suitable "venue" would be Kampala, commercial capital of Uganda, which is within two days flying from the United Kingdom and from all parts of British Africa.

The second step would be to abandon our Whitehall suspicions of the designs of the Union of South Africa in Africa. We should ask the Union to take the lead in All-African development and at the same time modify our bureaucratic control from Whitehall in favor of planning on the spot in Africa.

The third step is to decide which matters should come first. Thanks to the war impetus, and American competition, a network of air communications is well under way. But road communications are deplorable. The first projects for decision are undoubtedly the trans-African highways from Cape to Cairo and from West Africa to the Sudan and East Africa. Without a good system of roads, backward territories cannot be opened up nor can feeder air lines be established. Next in importance are big questions such as solving the Suez Canal problem when that Canal reverts entirely to the Egyptian Government in less than twenty-five years. Another project is the damming of the Nile in Uganda, the canalization of the "sud" area in the southern Sudan and the development there of a huge agrarian district with its local industries to make use of the products and by-products. There is also a rising demand for the revision and thorough implementation of the existing Congo Basin international treaties which cover a much wider scope than the mere Congo River area. Space does not permit of detailing the many other subjects such as English as the "lingua franca," radio telephony, coastal shipping etc.

The fourth step is the provision of money for All-African projects. The bulk of the Colonial Development grant of 120,000,000 pounds is being frittered away on the pet schemes of little local governments. A large portion of this sum, and of further installments, should be set aside for the bigger All-African projects and on a thirty year, not a ten year, plan.

The time is ripe for this "thirty-year Plan for British Africa" in the interests of all its peoples and of the strength and security of the British Commonwealth. We must develop a great belt of dispersed industries with good communications to solve the problem of raising standards of living as well as providing a new strategical base for the British Commonwealth. Ultimately it is only in this way that world peace can be assured.

The Indo-Chinese Resistance

Translated and digested at the Command and Staff College from a French article in "Revue des Troupes Coloniales" (France) November 1945.

WAR began for Indo-China on 18 June 1940. Immediately, General Nishihara presented his ultimatum, demanding the cession of bases in Tongking. France was prostrate, leaving Indo-China without defense, and Japan succeeded in extending her strategic and economic control over the whole of the Indo-Chinese peninsula. The Japs used our bases, our highways and railway lines, and their troops occupied the country.

Flushed with victory, these concessions sufficed the empire of the Mikado. Our troops did not constitute a serious threat, and the French administration, which had remained at its post, only saved the enemy the trouble of governing the country.

As the development of operations in the Pacific turned in favor of the Americans, however, Japan began to be uneasy. Beaten in the Marianas and the Caroline Islands, her communications threatened by the reestablishment of the Americans in the Philippines, and defeated in Burma, her only recourse for getting supplies to her troops in the Malay Peninsula and Thailand was the network of roads and railways of Indo-China.

Under these circumstances, it was vitally necessary that the Japs avoid having their

forces harassed and their lines of retreat cut by the French Army, which the loyalty of the peoples of Indo-China to France rendered all the more dangerous. Thus, Japan saw to it that her strategic uneasiness was covered up by invoking motives of a political order. She attempted to obtain the participation of Indo-China in a "fight to the finish for the liberation of Eastern Asia."

"Japan who, hitherto, has been extremely considerate in her dealings with Indo-China, might be forced to adopt harsh measures in bringing Hanoi to a realization of its duty and its true interests," declared the Japanese ambassador. This threat was not long in being put into execution.

The Military Situation

The occupation of Indo-China was effected so as to conform to a certain number of local conditions which influenced the disposition of the Japanese forces. Indo-China has 2,500 kilometers of coast line with three large ports, Saigon, Touran, and Haiphong, as well as the roadstead of Cam-Ramh, 1,300 kilometers from Singapore, Borneo, Manila, and Hongkong. Even without supremacy on the seas, one may, by means of submarines, paralyze enemy traffic in all these waters. This point did not escape the Japanese.

From the standpoint of aviation, Indo-China has many landing fields which constitute excellent bases for flights to southern China, Burma, the Dutch East Indies and the Philippines.

As for communications, the networks of railways and highways aided the Japanese in their movements between occupied China, Thailand and Malaya.

Up to the end of 1944, the Japanese occupied only the coastal regions in the heart of the communications network where they were able to act effectively.

In Tongking, the Japanese 21st Infantry Division was so disposed that they could move up the Red River, or move on Kao-Bang, Lang-Son, or Mon-Kay. It had established a series of small outposts along the frontier, and small garrisons were distributed in important cities near the airfields of Annam. Cochin-China had assumed the character of a vast corridor through which troops and supplies were moved, and was employed as a rest area. A guard garrison was stationed there and it was the communication zone for the Japanese Army to the south.

In November 1944, a column of the 21st Infantry Division penetrated into China by way of Lang-Son and effected a junction with the 23d Japanese Army coming down from Nanning. Allied successes in the Pacific, however, created a serious threat to the eastern coasts of Asia, and the Japanese were forced to modify the organization of their command, augment the numerical strength of their forces, and increase the effectiveness of their border patrols.

Headquarters of the Jap southeast theater of operations was at Saigon. A new division, formed in southern China, was sent to Tongking to reinforce the 21st Infantry Division, and assumed charge of the northern region. The Japanese at that time, were occupying Kao-Bang, Ha-Zhiang, Pholu, Lai-Chau, and Tra-Lin. On the coasts of Annam and Cochin-China, they held Vinh, Ha-Tin, Hue, Touran, Kang-Ngei, Ki-Nhon, Nha-Trang, Ba-Ngoi, Phan-Thiet, Cap-Saint-Jacques, Pulau-Kondor, and Pulau-Obi. Thus, the Japanese protected their civil organizations, and maintained a watch over the frontiers, the coasts, the Trans-Indo-China and Colonial Highway No. 1. In February 1945, they had four divisions, or about 50,000 men, in Indo-China.

In the face of this well-equipped army which was to receive additional and numerous reinforcements and was to possess the initiative in operations, we had only a few cadres, men who were tired out with five years of service in the country, troops who

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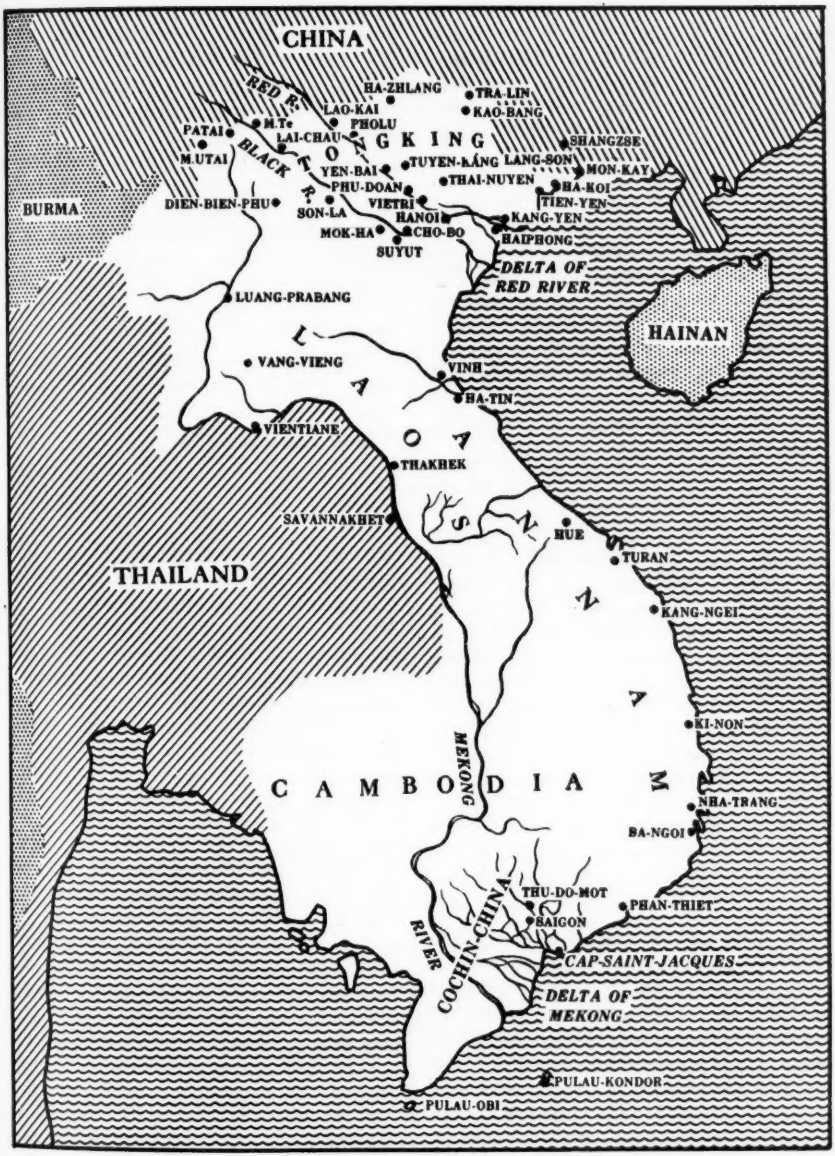
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COCHIN-CHINA
CAP-SAINT-JACQUES
DELTA OF MEKONG
PULAU-KONDOR
PULAU-OBI

were faithful but poorly equipped, no tanks, a few old airplanes, a few patrol boats—17,000 men in all. These units were distributed among the various posts on the Chinese frontier, where they constituted a protective force of thirteen battalions, five of which were in the Lang-Son area. West of Hanoi were six battalions, four of which were European. The remainder of our forces were established in centers of resistance which were easy to reduce: one battalion at Hue; 1,600 men in the valley of the Mekong between Vientiane, Thakhek and Savannakhet; 4,000 men in southern Annam; 1,000 men in Cambodia; 1,000 men in Cochin-China.

The Attack

The desire to rid herself of a threat to her communication lines and to get Indo-China completely under her political control, led Japan to evict the French administration and to attempt to disarm our troops. The Domei agency published the following declaration: "The day is not far distant when Indo-China will assume its proper place among the nations of greater Eastern Asia which have obtained their independence since the beginning of hostilities. It is necessary for the frustration of all territorial aims against Indo-China, to drive from the country all hostile influence and permit the people of Indo-China to acquire true racial independence in accordance with the principles enunciated by the common declarations of the nations of Eastern Asia."

On 15 March, according to the Tokyo radio, Indo-China declared its independence, but on 8 March, Japanese forces stationed in Indo-China had suddenly attacked the majority of the French garrisons. It was at the Kang-Yen ferry that the first shot was fired. About 2000 on 9 March an ultimatum was handed by the Japanese ambassador to Admiral Decoux. It simply confirmed the existing situation, and the principal French military and civilian personalities were arrested.

The Resistance

It was not until the evening of 9 March that the French Army Commander was informed of the Japanese attack. He immediately sent a message to all his forces which was the signal for the execution of the various measures provided for in a previously established plan. Haiphong was warned at 1900 on the 9th, but the enemy attack began at 1915. Throughout all the remainder of Tongking, fighting began between 2000 and 2030.

Throughout the whole of the country, while a certain number of detachments were to remain in their places, mobile elements began a withdrawal. It would have been impossible to prolong a static form of resistance for very long, so it was planned to entice the Japanese to pursue our best troops into the zones that were the most impassable and best suited for defense. In order to permit the withdrawal, the less mobile elements were to delay the enemy as long as possible. Thus the Japanese found themselves obliged, if they wished to avoid all offensive action on our part, to deploy and engage very large forces for the mopping up of vast regions. The forces thus engaged would be lacking in neighboring theaters of operations where important action was in progress. In the execution of this plan the mobile units of Saigon set out in the direction of Thu-Do-Mot heading for the Moi plateaus, but was stopped on the way.

In Cochin-China and in Cambodia, the nature of the terrain does not lend itself to the formation of a maquis, and the two French regiments with their personnel divided between a dozen garrisons, were able to improvise nothing more than token resistance against the attack of the Japanese forces, and even this died out within a week's time. In Annam, the Hue garrison which was not attacked until the 10th, resisted strongly. A part of the garrison

was able to reach the mountains where it continued its withdrawal and organized into two guerrilla units.

But it was in Tongking that the operations assumed the greatest proportions. Here, our forces were the most numerous. The Japanese who had considerably augmented the numerical strength of their occupational forces were not able to carry out troop movements without our knowledge and, moreover, the terrain was favorable to us. The overall plan was, therefore, destined to work. All forces which had escaped the Japanese formed delaying detachments and withdrew slowly along divergent lines in the direction of the Chinese frontier. The largest groups defended in the Haut-Laos. Thus, the scattered Japanese were not able to crush our forces which finally regrouped in China.

The Operations East of the Red River

Mon-kay sector:—On 13 March, the French forces held the first military district, but Ha-Koi which had been heroically defended, had fallen.

On 21 March the entire Mon-kay garforced the French to begin a retreat which had been contemplated the day before, but reinforced by air force and naval personnel who reached Tien-Yen, the latter were able to counterattack and regain control of the situation in Tien-Yen from which the Japanese were driven after very hard fighting. Unfortunately, however, our forces did not succeed in breaking into Ha-Koi which they had surrounded.

On 21 March the entire Mon-kay garrison retreated in the direction of Shangsze and on the 31st, the Japanese reached the city.

The valley of the Red River:—On 9 March began the occupation of all communication centers in the valley. The garrisons of Lao-Kai, Yen-Bai, Phu-Tho, and Hanoi overwhelmed by numbers, ceased fire after a day of hard fighting, and on the 10th the Japanese took these places as well as Vietri.

East of the Red River:—During the night 10-11 March, a battalion of Colonial Infantry and a battery of 75's left Thai-Nuyen for Tuyen-Kang, and on 12 March at about 1800, another company arrived at Thai-Nuyen. This latter company was immediately sent to Phu-Doan where it made contact with Japanese elements which had arrived from Vietri by truck. This company, stationed at the Song-Chay bridge, held the Japanese attack until the morning of 13 March when it joined other forces to the north. Another battalion moved from Cho-Chu to Tuyen-Kang and later succeeded in reaching China. Elements of the 9th Colonial Infantry Regiment were still fighting in the Kao-Bang area until the beginning of April.

The Operations West of the Red River

The delta garrisons and, in particular, the Tong brigade, comprising the 1st Infantry Regiment of Tongking Riflemen and the 5th Regiment of the Foreign Legion regrouped in the valley of the Black River after having stubbornly disputed its crossing with the Japanese forces on 10 March, and having been engaged in fights near Cho-Bo, Suyut and Moc-Ha, where rear guards had been left. The success of these operations permitted the regrouping of all the forces in the Son-La area after 12 March.

The Haut-Laos areas were, quite evidently, the logical zone into which to withdraw and the garrisons immediately surrounding them very quickly took refuge there. The Vientiane garrison moved out on 9 March and arrived at Vang-Vieng on the 14th.

The seriousness of the situation west of the Red River had not developed as rapidly as in eastern Tongking, but it became very bad around 19 March. Our troops lacked everything, yet they offered effective resistance in a well conducted delaying action.

The Japanese pressure increased, and one enemy column moved on Son-La which

it soon passed and reached Dien-Bien-Phu on the 31st, but Dien-Bien-Phu did not fall until 6 April. On that day we lost our last airfield which had still represented to our troops a chance for the arrival of aid from the outside. A second enemy column headed toward Lai-Chau which was held by 1,200 men, and a third Jap column started for Luang-Prabang. Pressure was very heavy on the French forces which had set out from Vientiane and which passed beyond Vang-Vieng at the end of the month, moving toward Luang-Prabang, and on 9 April the Japanese appeared to be established on a line south of Luang-Prabang. Volunteers poured in to reinforce our troops, but in spite of this, it became necessary to abandon the city on 7 April. An enemy armored column which had set out from Vinh was very successfully counterattacked with the aid of American aviation, and the Japanese suffered very heavy losses, but it was impossible for us to exploit our success, owing to insufficient forces. Thus, the Japanese pursued their mopping up operations of Laos by columns coming in from the south, east and north.

After 18 April, two Japanese columns converged on what remained of the northern forces which were still holding out and on the 19th, after two engagements, the Japanese reached the Chinese frontier at Patai.

The passage of the northern sub-unit into China was planned for 19 April. It, however, was forced to conduct stubborn delaying actions and withdraw more slowly. In the center, a Japanese column was attempting to cut the line of retreat toward China. This maneuver was stopped, however, and our forces succeeded in falling back to M. Utai on 21 April.

A few days let-up of the attack permitted the southern units to regroup, but the physical exhaustion of the troops was such that they were not able to hold up under the pressure of a new Jap offensive and were obliged to cross the frontier. Isolated elements continued to carry on guerrilla warfare against the enemy's rear.

On 29 April, no news had arrived from the guerrilla groups on the Bas-Laos and it was concluded that they had been wiped out. Japanese forces were very strong in that region.

On 20 May, the last of the self-contained groups had crossed the frontier into China, but small and isolated groups continued to arrive every day.

The Japanese did not succeed in crushing our forces which, already reorganized and regrouped, undertook operations against them. Moreover, the resistance may be credited with having made it possible for the Chinese forces to carry their successes to the very gates of Indo-China, in their operations against Nanning.

In the future peace-loving nations again may be taken unaware by aggression, unless, of course, they develop special measures capable of preventing aggression.

Generalissimo Josef Stalin

Selection and Design of Tank Armament

Digested at the Command and Staff College from an article by the School of Tank Technology in "The Tank" (Great Britain) September 1946.

Design Procedure

IN the general design of tanks, the first step is the selection of a gun with the desired fire-power. This selection depends on what types of target will have to be attacked by the proposed tank, and what are to be the maximum ranges of engagement.

These points must first be decided by the soldier in accordance with the intended tactical role of the new vehicle. When these decisions have been made, it is for the ammunition and gun designers to work out an appropriate projectile design and develop a suitable gun to fire it, bearing in mind the peculiar limitations imposed by mounting such a weapon in a tank.

Next the tank-mounting designer can lay out a mounting for the gun with sighting gear and laying controls, building around them a fighting chamber with sufficient space for the crew, ammunition and other storage. He must fit this fighting chamber into the limits of weight, height and space between tracks allowed him by the general design of the whole tank in view of transportation restrictions, and enclose it with armor of a specified thickness, in which must be fitted adequate means of outside vision.

If the mounting designer cannot get all this into a turret with all-around traverse and yet keep within the limitations of the general designer, the latter may be forced to offer the soldier limited-traverse equipment, like the German *Jagdpanther* and *Jagdtiger*. The soldier has then to decide whether a powerful gun and thick armor are worth more tactically than 360 degrees of traverse.

Selection of a Tank Gun

All battle experience goes to show that the infantry is the most important "arm" in any army. The destruction of the enemy infantry is the main purpose of all arms, including tanks, in our own army. Thus, for most types of tank, the enemy infantry, the defenses they hold, and their supporting artillery, are the main targets. The best type of projectile against such targets is high explosive (HE) shell.

Unfortunately, all armored vehicles are vulnerable, not only to ground antitank guns, but also to antitank guns mounted in enemy armored vehicles. Thus, the tank may be prevented from carrying out its main task, unless it can first defeat the enemy "armor." This requires an armor-piercing (AP) projectile.

Against infantry and "soft" targets, HE shell, even though small, will usually have some effect, whether these be direct hits or only near misses. On the other hand, against "hard" targets (i.e. tanks), only a direct hit with a suitably designed shell large enough to pierce the armor will be effective. In other words, the requirements for HE performance are not very critical, whereas those for armor penetration are extremely so. Thus, although HE firing may be the main purpose of tanks, AP firing will require more attention in design.

For armor penetration, the best type of projectile is the high velocity shot or shell, which depends mainly on its weight and striking velocity for effect. This necessitates a gun of caliber large enough to fire a shot of adequate weight, with a long barrel in which to develop sufficient velocity, and a large chamber in which to burn the amount of propellant required to provide the velocity. This results in a large and heavy cartridge and a cumbersome gun of short life.

For high explosive effect, one requires a shell with a large capacity for explosive

filling. To get this, it is generally considered that the caliber of the gun should be at least three inches. If this shell is to be fired from the same gun with the same velocity as the AP, it will have to be so thick-walled to withstand the severe firing stresses, as to reduce seriously its capacity for HE filling. Moreover, high velocities reduce the effectiveness of HE shell in several ways. For HE then, it is much better to use a low velocity, high capacity shell, which only requires a short gun with a small charge. This gives a round, of which a large number can be carried in the tank, and a gun which is easy to mount in a turret and has a long life. Such a gun will, of course, be unable to fire any AP projectile, except hollow charge, which is inferior in accuracy and penetration.

The size of HE shell required is unlikely to increase much in the future because infantry can become neither more splinter resistant, nor able to make stronger fox-holes. Tank armor, however, is getting thicker and thicker, so that AP weapons must get bigger and bigger as time goes on.

The soldier is then faced with the following problem:

He has to ask the designer to give him an AP projectile and gun powerful enough to penetrate enemy armor, yet this is only for what is really a secondary or support role. For present conditions, this gun will probably have a caliber of over three inches. Shall he also ask the designer to produce for him a separate gun for firing HE to carry out the main task, and relegate the AP weapon entirely to a support role, or shall he fire his HE out of the AP weapon (probably with a reduced charge to give lower velocity)?

If he uses the AP weapons for HE, he will not be able to carry many HE rounds, because of their uneconomically large cartridge cases, and because some of the stowage will already be occupied with AP. The large cartridge will give only a low rate of fire. Moreover, the rapid wear with AP will necessitate frequent calibration for indirect fire and semi-indirect HE shooting.

If separate AP and HE weapons are asked for in emergency the AP weapon must, of course, be able to fire HE and the HE weapon, hollow charge (in lieu of AP).

The Tank Gun Designer's Problem

The ideal tank gun should fulfill the following major requirements in order of importance:

(1) A light, short cartridge, the complete round not weighing more than about forty-five pounds with an extreme upper limit of sixty-five pounds when the gun is mounted with limited traverse in the hull of the vehicle.

(2) An adequate life.

(3) A barrel as short as possible, with center of gravity as near the breech as possible.

Such other features as weight of projectile, caliber, and muzzle velocity must be so adjusted as best to fit the above and yet provide the specified performance. It should be noted here that the weight of the gun is of minor importance, although lightness is desirable from the point of view of turrent balance.

For HE firing only it is quite easy to comply with the foregoing specifications, but modern penetration requirements, even when special tungsten-carbide-cored shot are to be used, are so difficult to meet that it may not be possible in the future to provide a gun with reasonable life without exceeding the cartridge weight limitations—particularly if an all-round traverse turret is insisted on. It is important to note that the difficulty does not arise in loading the gun, but in

getting the ammunition out of the stowage into a position from which it can be loaded. In this situation the fixed cartridge ceases to be the quickest and easiest to handle inside an armored vehicle. Instead the round may have to be split into two or more easily handled components—the separate (or semi-fixed) cartridge.

Some of the Problems of the Mounting Designer

The first endeavor of the mounting designer is to give a sufficient arc of elevation and depression for the weapons and yet provide adequate protection and ease of control.

If the arc is large it will be difficult to design a mantlet which does not leave gaps at the top or bottom at full depression or elevation, and is also completely splash proof against heavy small arms fire. Current British practice is to provide twenty degrees elevation and twelve degrees depression, but other countries have had to use less—usually less depression.

As guns get longer and mantlets thicker, the centers of gravity of successive designs of mounting get further and further in front of the trunnions. If the designer tries to counteract this by moving the gun back in the mounting he will have to make the turret roof higher to clear the breech of the gun on recoil at full depression. Instead, he must neutralize the muzzle heaviness by a spring or hydropneumatic equilibrator inside the turret.

It is sometimes thought that the designer has difficulty in making the mounting strong enough to take the trunnion pull of the gun. So far is this from being a difficulty that several designers have been tempted to dispense with the recoil system and mount the gun rigidly in the cradle. They have had some measure of success, although other difficulties were introduced.

The recoil system is still then an essential of a tank gun mounting, and there is generally no difficulty in providing sufficient room behind the gun for recoil. If there were not enough room for recoil there would certainly not be enough space to load the large cartridges fired by present-day tank guns. The designer's two problems here are over-heating and the use of ammunition of different muzzle velocities.

The function of the buffer is to dissipate the recoil energy of the gun by converting it to heat (due to the friction of oil passing through ports). Obviously, if a high rate of fire is maintained for some time the buffer will get very hot indeed, with the result that the gun fails to run out. Some modern guns may have a very large recoil energy to be converted to heat, so the designer has to provide rather a large capacity of oil to absorb it.

As stated earlier, when a gun fires both AP and HE it is better to fire the HE at a much lower muzzle velocity than is necessary for AP. This results in a shorter recoil. It is then a problem to design a recoil system which will function equally well with both high and low velocity ammunition and allow sufficient length of recoil for the semi-automatic gear to operate both types.

Another question that needs clearing up is the purpose of the muzzle brake. Its function is to reduce the backward momentum of the gun by deflecting to the side or rear some of the high pressure gases which emerge with high velocity from the muzzle after the projectile has left. The principle is the same as that of jet-propulsion, the deflected gases giving a forward thrust on the muzzle. In general, a muzzle brake is undesirable on a tank gun, as it greatly increases the out-of-balance of the mounting and causes the gun to "whip" when traveling. It also increases the risk of injury to troops by

diverting the blast to the rear. The chief reasons for fitting a brake are:

(a) When the designer "up-guns" an existing vehicle to counter the introduction of heavier armor by the enemy. This enables him to use the original recoil system.

(b) To reduce the amount of recoil energy which has to be converted to heat by the buffer, and so prevent over-heating.

(c) To obtain improved steadiness of the vehicle when firing—especially armored cars.

(d) To improve observation by deflecting muzzle smoke out sideways. Whether it is successful in this depends a good deal on the wind and the dustiness of the ground.

I repulse the idea that war is inevitable; still more that it is imminent. It is because I am so sure that our fortunes are in our own hands and that we hold the power to save the future that I feel the duty to speak out now. . . . . .

My hope is that generous instincts of unity will not depart from us in these times of tremendous exertions and grievous sacrifices, and that we shall not fall apart, abroad or at home, so as to become the prey of the little folk who exist in every country and who frolic alongside the Juggernaut car of war, to see what fun or notoriety they can extract from the proceedings.

Winston Churchill